

ASRC Searcher: Jeanne Horrigan  
Serial 09/965681  
September 3, 2003

1

File 350:Derwent WPIX 1963-2003/UD,UM &UP=200355  
File 347:JAPIO Oct 1976-2003/Apr(Updated 030804)  
File 371:French Patents 1961-2002/BOPI 200209

Set	Items	Description
S1	3	AU='EKLUND O'
S2	2	AU='BERGFALK' OR AU='BERGFALK H'
S3	1	S1 AND S2
S4	3	S1:S2 NOT S3

3/34/1 (Item 1 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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014573603 \*\*Image available\*\*

WPI Acc No: 2002-394307/200242

**Detecting and treating sleep respiratory disorders by periodic sampling  
of gas flow to mask and feeding breathing pattern parameters to  
artificial neural network**

Patent Assignee: BREAS MEDICAL AB (BREA-N); BERGFALK H (BERG-I); EKLUND O  
(EKLUN-I)

Inventor: EKLUND O ; HEDNER J; KNAGENHJELM P; BERGFALK H

Number of Countries: 098 Number of Patents: 004

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 200228281	A1	20020411	WO 2001SE2085	A	20010928	200242 B
AU 200190474	A	20020415	AU 200190474	A	20010928	200254
US 20030000528	A1	20030102	US 2001965681	A	20010927	200305
EP 1328194	A1	20030723	EP 2001970474	A	20010928	200350
			WO 2001SE2085	A	20010928	

Priority Applications (No Type Date): SE 20003531 A 20001002

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes

WO 200228281 A1 E 28 A61B-005/087

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA  
CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN  
IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ  
PH PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW  
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR  
IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

AU 200190474 A A61B-005/087 Based on patent WO 200228281

US 20030000528 A1 A62B-007/00

EP 1328194 A1 E A61B-005/087 Based on patent WO 200228281

Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT  
LI LT LU LV MC MK NL PT RO SE SI TR

Abstract (Basic): WO 200228281 A1

NOVELTY - Method consists in using a Kohonen-map type artificial  
neural network (ANN) to analyze breathing gas flow data. A mask  
connected to a continuous positive airway pressure (CPAP) system is  
placed over the patient airway, the gas flow is sampled periodically,  
breathing pattern parameters are calculated periodically and fed to an  
ANN trained to recognize breathing patterns characteristic of sleep  
disordered breathing, the parameters are analyzed and the pressurized  
breathing gas pressure is controlled in response to the ANN output.  
Parameters are fed to the ANN at 2-30Hz and are cepstrum coefficients,  
energy slope and difference in trend.

DETAILED DESCRIPTION - The ANN is trained with data collected from  
patients during a particular stage of sleep, resting in a particular

body position and under the influence of drugs, and using a polysomnography system. There is an INDEPENDENT CLAIM for an apparatus for detecting and treating disordered breathing during sleep, (2) an automatic continuous positive airways pressure apparatus (ACPAP).

USE - Method is for detecting and treating breathing disorders during sleep.

ADVANTAGE - Method enables continuous positive airways pressure to be delivered to the patient.

DESCRIPTION OF DRAWING(S) - The figure shows a block diagram of parameter extraction.

pp; 28 DwgNo 1/4

Derwent Class: P31; P34; P35; Q66; S05; T01; T02

International Patent Class (Main): A61B-005/087; A62B-007/00

International Patent Class (Additional): A61M-016/00; F16K-031/02;

G06N-003/02

**4/26, TI/1 (Item 1 from file: 350)**

DIALOG(R) File 350: Derwent WPIX

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013514960

WPI Acc No: 2000-686906/200067

**Production of respiratory mask for use in medical application, involves performing contactless determination of the topography of persons's facial area, based on which material for the mask is shaped**

**4/26, TI/2 (Item 2 from file: 350)**

DIALOG(R) File 350: Derwent WPIX

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008468227

WPI Acc No: 1990-355227/199048

**Moulding compsn. for mfr. of chemically resistant components - comprises polyphenol polyformaldehyde resin, feldspar, and amorphous silica**

**4/26, TI/3 (Item 1 from file: 371)**

DIALOG(R) File 371: French Patents

(c) 2002 INPI. All rts. reserv. All rts. reserv.

000713446

**Title: CELLULE DYNAMOMETRIQUE**

Patent and Priority Information (Country, Number, Date):

Patent: FR 2522815 - 19830909

File 348:EUROPEAN PATENTS 1978-2003/Aug W04

File 349:PCT FULLTEXT 1979-2002/UB=20030828,UT=20030821

Set	Items	Description
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S1	4	AU='EKLUND OVE'
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S2	2	PN=AU 200190474 + PN=EP 1328194 + PN=US 20030000528 + PN=WO 200228281
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S3	2	S1 NOT S2
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3/6/1 (Item 1 from file: 348)

01219274

**RESPIRATORY MASK AND METHOD FOR ITS MANUFACTURE**

3/6/2 (Item 1 from file: 349)

00747610

**RESPIRATORY MASK AND METHOD FOR ITS MANUFACTURE**

File 155:MEDLINE(R) 1966-2003/Aug W5

File 5:Biosis Previews(R) 1969-2003/Aug W4

File 73:EMBASE 1974-2003/Aug W4

File 34:SciSearch(R) Cited Ref Sci 1990-2003/Aug W4

File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec

Set	Items	Description
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S1	10	AU='EKLUND O' OR AU='EKLUND O.'
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S2	9	RD (unique items)[not relevant]
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File 155:MEDLINE(R) 1966-2003/Aug W5  
File 5:Biosis Previews(R) 1969-2003/Aug W4  
File 73:EMBASE 1974-2003/Aug W4  
File 34:SciSearch(R) Cited Ref Sci 1990-2003/Aug W4  
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec  
File 144:Pascal 1973-2003/Aug W4  
File 2:INSPEC 1969-2003/Aug W4  
File 6:NTIS 1964-2003/Aug W5  
File 8:Ei Compendex(R) 1970-2003/Aug W4  
File 94:JICST-EPlus 1985-2003/Aug W5  
File 95:TEME-Technology & Management 1989-2003/Aug W3  
File 99:Wilson Appl. Sci & Tech Abs 1983-2003/Jul  
File 65:Inside Conferences 1993-2003/Aug W5  
File 35:Dissertation Abs Online 1861-2003/Aug

Set	Items	Description
S1	346395	NEURAL()NETWORK? ?
S2	1931886	VENTILAT? OR RESPIRAT? OR CPAP OR CONTINUOUS() POSITIVE() AI- RWAY() PRESSURE
S3	7640	KOHONEN
S4	4439	CEPSTRUM
S5	407	INVERSE() FAST() FOURIER() TRANSFORM
S6	1726	S1 AND S2
S7	15487	CPAP OR CONTINUOUS() POSITIVE() AIRWAY() PRESSURE
S8	29	S1 AND S7
S9	0	S8 AND S3:S5
S10	29	S8
S11	17	RD (unique items)
<b>S12</b>	<b>17</b>	<b>Sort S11/ALL/PY,D</b>
S13	3	S6 AND S3:S5
<b>S14</b>	<b>2</b>	<b>RD (unique items)</b>

**12/6/8 (Item 8 from file: 34)**  
06216374 Genuine Article#: YC431 Number of References: 45  
**Title: Striatal dopamine metabolism correlated with frontotemporal glucose utilization in Alzheimer's disease: A double-tracer PET study (**  
Publication date: 19971000

**12/6/12 (Item 12 from file: 34)**  
05675125 Genuine Article#: WP360 Number of References: 35  
**Title: Twenty-four-hour melatonin and core body temperature rhythms: Their adaptation in night workers (ABSTRACT AVAILABLE)**  
Publication date: 19970300

**12/6/13 (Item 13 from file: 34)**  
05524965 Genuine Article#: WE285 Number of References: 20  
**Title: A new approach to the analysis of the human sleep/wakefulness continuum (ABSTRACT AVAILABLE)**  
Publication date: 19961200

**12/6/17 (Item 17 from file: 434)**  
09252148 Genuine Article#: R7869 Number of References: 22  
**Title: WHY LOW-DOSE BENZODIAZEPINE-DEPENDENT INSOMNIACS CANT ESCAPE THEIR SLEEPING PILLS**

**12/7/1 (Item 1 from file: 2)**  
DIALOG(R) File 2:INSPEC

(c) 2003 Institution of Electrical Engineers. All rts. reserv.  
7461967 INSPEC Abstract Number: A2003-01-8770E-010, B2003-01-7510-025,  
C2003-01-7330-150

**Title: A fuzzy inference system for detection of obstructive sleep apnea**

Author(s): Nazeran, H.; Almas, A.; Behbehani, K.; Burk, J.; Lucas, E.

Author Affiliation: Sch. of Inf. & Eng., Flinders Univ. of South Australia, Adelaide, SA, Australia

Conference Title: 2001 Conference Proceedings of the 23rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (Cat. No.01CH37272) Part vol.2 p.1645-8 vol.2

Publisher: IEEE, Piscataway, NJ, USA

Publication Date: 2001 Country of Publication: USA 4 vol. 4132 pp.

ISBN: 0 7803 7211 5 Material Identity Number: XX-2002-02146

U.S. Copyright Clearance Center Code: 0-7803-7211-5/01/\$17.00

Conference Title: 2001 Conference Proceedings of the 23rd Annual International Conference of the IEEE Engineering n Medicine and Biology Society

Conference Date: 25-28 Oct. 2001 Conference Location: Istanbul, Turkey

Medium: Also available on CD-ROM in PDF format

Language: English Document Type: Conference Paper (PA)

Treatment: Practical (P); Experimental (X)

Abstract: A fuzzy inference system (FIS) was developed to detect obstructive sleep apnea (OSA) by analyzing the respiratory airflow signal in adults. The parameters analyzed were the normalized area and the standard deviation of consecutive 3-second intervals of baseline adjusted and rectified airflow signal. Fuzzy logic was used to process these parameters to detect apnea and hypopnea when the output values were within a specified range extracted from OSA patient data. The FIS comprised of three major stages of computation: fuzzification, fuzzy rule evaluation and defuzzification. Seven males and two females with an average age of 48 years (range: 26 - 66 years), an average weight of 102 kg (range: 63 - 159 kg), an average height of 1.7 m (range: 1.5 - 1.8 m) and an average body mass index (BMI) of 33 kg/m/sup 2/ (range: 21 - 42 kg/m/sup 2/) participated in this study. Patients spent at least 8 hours in an accredited sleep laboratory. However, patient data was collected for only part of this time. The total amount of test time for all nine patients was 38.83 hours with an average of 4.31 hours/patient (range: 1.92 - 7.63 hours). The total number of apnea events occurring during this time was 808, and the number of hypopnea events was 694. The membership functions for the FIS were derived by analyzing apnea and hypopnea events in four patients. The data from all nine patients were used in algorithm performance evaluation. The apnea and hypopnea events were scored by a sleep specialist and were used to test the correct detection rate by the FIS. The results demonstrated that the FIS reached an overall correct detection rate of 83% across all patients. The false negative rate was 17% and the false positive rate was 12%. The correct detection rate varied from patient to patient and correct rates greater than 90% were achieved in three patients. This study suggests that fuzzy inference could provide an intelligent algorithm for control of a **continuous positive airway pressure (CPAP)** machine. It would detect apnea and hypopnea events and automatically adjust the pressure to eliminate them. The performance of the algorithm could be further optimized to give increased detection rates. This could be achieved by performing further studies on a larger OSA patient population and utilizing augmentative methods such as **neural networks** to better sense the fuzzy patterns in the OSA data. (10 Refs)

Subfile: A B C

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12/7/2 (Item 2 from file: 144)

DIALOG(R) File 144:Pascal

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14253982 PASCAL No.: 99-0457148

Respiratory sound recordings for detection of sleep apnea  
Virtual intelligence / dynamic neural networks : academic /  
industrial / NASA/ defense / technical interchange and tutorials :  
Stockholm, 22-28 June 1998

WALDEMARK K; AGEHED K; LINDBLAD T

LINDBLAD Thomas, ed; PADGETT Mary Lou, ed; KINSER Jason, ed

Department of Physics, Royal Institute of Technology, 104 05 Stockholm,  
Sweden

International Society for Optical Engineering, Bellingham WA, United  
States.

Workshop on virtual intelligence / dynamic neural networks (Stockholm  
SWE) 1998-06-22

Journal: SPIE proceedings series, 1999, 3728 408-431

ISBN: 0-8194-3202-4 ISSN: 1017-2653 Availability: INIST-21760;  
354000084558680370

No. of Refs.: 17 ref.

Document Type: P (Serial); C (Conference Proceedings) ; A (Analytic)

Country of Publication: United States

Language: English

Sleep apnea is characterized by frequent prolonged interruptions of breathing during sleep. This syndrome causes severe sleep disorders and is often responsible for development of other diseases such as heart problems, high blood pressure and daytime fatigue, etc. After diagnosis, sleep apnea is often successfully treated by applying positive air pressure ( CPAP ) to the mouth and nose. Although effective, the ( CPAP ) equipment takes up a lot of space and the connected mask causes a lot of inconvenience for the patients. This raised interest in developing new techniques for treatment of sleep apnea syndrome. Several studies have indicated that electrical stimulation of the hypoglossal nerve and muscle in the tongue may be a useful method for treating patients with severe sleep apnea. In order to be able to successfully prevent the occurrence of apnea it is necessary to have some technique for early and fast on-line detection or prediction of the apnea events. This paper suggests using measurements of respiratory airflow (mouth temperature). The signal processing for this task includes the use of a window short-FFT technique and uses an artificial back propagation neural net to model or predict the occurrence of apneas. The results show that early detection of respiratory interruption is possible and that the delay time for this is small.

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12/7/3 (Item 3 from file: 144)

DIALOG(R) File 144:Pascal

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13668629 PASCAL No.: 98-0376667

Detection of apnea using short window FFT technique and artificial  
neural network  
Applications and science of computational intelligence : Orlando FL,  
13-16 April 1998

WALDEMARK K; AGEHED K; LINDBLAD T; WALDEMARK J

ROGERS Steven K, ed; FOGEL David B, ed; BEZDEK James C, ed; BOSACCHI

Bruno, ed

Department of Physics, Royal Institute of Technology, Frescativ. 24, 104  
05 Stockholm, Sweden

International Society for Optical Engineering, Bellingham WA, United  
States.

Applications and science of computational intelligence. Conference (   
Orlando FL USA) 1998-04-13

Journal: SPIE proceedings series, 1998, 3390 122-133

ISBN: 0-8194-2839-6 ISSN: 1017-2653 Availability: INIST-21760;  
354000076400150130

No. of Refs.: 17 ref.

Document Type: P (Serial); C (Conference Proceedings) ; A (Analytic)

Country of Publication: United States

Language: English

Sleep apnea is characterized by frequent prolonged interruptions of breathing during sleep. This syndrome causes severe sleep disorders and is often responsible for development of other diseases such as heart problems, high blood pressure and daytime fatigue, etc. After diagnosis, sleep apnea is often successfully treated by applying positive air pressure ( **CPAP** ) to the mouth and nose. Although effective, the ( **CPAP** ) equipment takes up a lot of space and the connected mask causes a lot of inconvenience for the patients. This raised interest in developing new techniques for treatment of sleep apnea syndrome. Several studies have indicated that electrical stimulation of the hypoglossal nerve and muscle in the tongue may be a useful method for treating patients with severe sleep apnea. In order to be able to successfully prevent the occurrence of apnea it is necessary to have some technique for early and fast on-line detection or prediction of the apnea events. This paper suggests using measurements of respiratory airflow (mouth temperature). The signal processing for this task includes the use of a short window FFT technique and uses an artificial back propagation **neural net** to model or predict the occurrence of **apneas**. The results show that early detection of respiratory interruption is possible and that the delay time for this is small.

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**12/7/4 (Item 4 from file: 155)**

DIALOG(R) File 155:MEDLINE(R)

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11514099 98402653 PMID: 9731004

**Sleep fragmentation indices as predictors of daytime sleepiness and nCPAP response in obstructive sleep apnea.**

Bennett L S; Langford B A; Stradling J R; Davies R J

The Osler Chest Unit, Churchill Hospital, Headington, Oxford, United Kingdom.

American journal of respiratory and critical care medicine (UNITED STATES ) Sep 1998, 158 (3) p778-86, ISSN 1073-449X Journal Code: 9421642

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

Sleep fragmentation and respiratory disturbance measures are used in the assessment of obstructive sleep apnea (OSA) but have proved to be disappointingly poor correlates of daytime sleepiness. This study investigates the ability of electroencephalograph (EEG) and non-EEG sleep fragmentation indices to predict both presenting sleepiness and the improvement in sleepiness with subsequent nasal **continuous positive**

**airway pressure** (nCPAP) therapy (nCPAP responsive sleepiness). Forty-one patients (36 men, 5 women), ranging from nonsnorers to severe OSA (> 4% O2 dip rate, median 11.1, range 0.4 to 76.5), had polysomnography with microarousal scoring, computerized EEG analysis, autonomic arousal detection, and body movement analysis. All patients received a trial of nCPAP regardless of sleep study outcome. Spearman's correlation analysis showed significant and similar associations between all sleep fragmentation indices with both pretreatment and nCPAP responsive sleepiness. There was no deterioration in sleepiness on nCPAP in the nonsnorers. Using stepwise multiple regression analysis, the best predictor of nCPAP responsive subjective and objective sleepiness was body movement index, explaining 38% and 43% of the variance, respectively. Variability in EEG sleep depth, quantified from computerized EEG analysis, was the only other index to contribute to these models. Together these indices explained 44% and 51% of the subjective and objective response to nCPAP, respectively. These results suggest that sleep fragmentation indices are useful for identifying OSA patients with sleepiness likely to respond to nCPAP.

Record Date Created: 19981005

Record Date Completed: 19981005

**12/7/5 (Item 5 from file: 34)**

DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

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07163517 Genuine Article#: 131BH Number of References: 47

**Title: Toward prediction of physiological state signals in sleep apnea**

Author(s): Bock J; Gough DA (REPRINT)

Corporate Source: UNIV CALIF SAN DIEGO,DEPT BIOENGN/LA JOLLA//CA/92093

(REPRINT); UNIV CALIF SAN DIEGO,DEPT BIOENGN/LA JOLLA//CA/92093

Journal: IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING, 1998, V45, N11 (NOV), P1332-1341

ISSN: 0018-9294 Publication date: 19981100

Publisher: IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC, 345 E 47TH ST, NEW YORK, NY 10017-2394

Language: English Document Type: ARTICLE

**Abstract:** A recurrent connectionist model is described to predict dynamic respiratory state in the apneic sleeping patient. The time-domain model of nonlinear time-lagged interactions between heart rate, respiration, and oxygen saturation was developed to implicitly embed the dynamics of the respiration and cardiovascular control systems. **Multiple future time scales were enforced on the network** during training to explore the limits of the prediction horizon and produce a global representation of dynamic state trajectory. Predicted apneic respiration state results are presented in terms of invariant geometric statistics (largest Lyapunov exponent  $\lambda(L)$  and correlation dimension  $D(c)$ ). The  $\lambda(L)$  prediction error was 13%, while  $D(c)$  error was within 9% of the true time series value. The magnitude of these errors may fall within experimental noise levels. This methodology may eventually be useful in dynamic control of **continuous positive airway pressure (CPAP)** therapy devices, and may lead to increased patient compliance with this therapy.

**12/7/6 (Item 6 from file: 155)**

DIALOG(R)File 155:MEDLINE(R)

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11096017 97389715 PMID: 9246851

**Pharyngeal wall vibration detection using an artificial neural network.**



Behbehani K; Lopez F; Yen F C; Lucas E A; Burk J R; Axe J P; Kamangar F  
Biomedical Engineering, University of Texas, Arlington, USA. kb@uta.edu  
Medical & biological engineering & computing (ENGLAND) May 1997, 35  
(3) p193-8, ISSN 0140-0118 Journal Code: 7704869

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

An artificial- **neural - network** -based detector of pharyngeal wall vibration (PWV) is presented. PWV signals the imminent occurrence of obstructive sleep apnoea (OSA) in adults who suffer from OSA syndrome. Automated detection of PWV is very important in enhancing **continuous positive airway pressure (CPAP)** therapy by allowing automatic adjustment of the applied airway pressure by a procedure called automatic positive airway pressure (APAP) therapy. A network with 15 inputs, one output, and two hidden layers, each with two Adaline-nodes, is used as part of a PWV detection scheme. The network is initially trained using nasal mask pressure data from five positively diagnosed OSA patients. The performance of the ANN-based detector is evaluated using data from five different OSA patients. The results show that on the average it correctly detects the presence of PWV events at a rate of approximately 92% and correctly distinguishes normal breaths approximately 98% of the time. Further, the ANN-based detector accuracy is not affected by the pressure level required for therapy.

Record Date Created: 19970822

Record Date Completed: 19970822

12/7/7 (Item 7 from file: 34)

DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

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06294170 Genuine Article#: YG619 Number of References: 34

**Title: On the use of neural network techniques to analyse sleep EEG data - First communication: Application of evolutionary and genetic algorithms to reduce the feature space and to develop classification rules**

Author(s): BaumgartSchmitt R; Herrmann WM (REPRINT) ; Eilers R; Bes F

Corporate Source: FREE UNIV BERLIN, LABOR KLIN PSYCHOPHYSIOL, PSYCHIAT KLIN & POLIKLIN, ESCHENALLEE 3/D-14050 BERLIN//GERMANY/ (REPRINT); FREE UNIV BERLIN, BENJAMIN FRANKLIN HOSP, DEPT PSYCHIAT, INTERDISCIPLINARY SLEEP CLIN/D-1000 BERLIN//GERMANY//; PAREXEL INT CORP,/BOSTON//MA/

Journal: NEUROPSYCHOBIOLOGY, 1997, V36, N4, P194-210

ISSN: 0302-282X Publication date: 19970000

Publisher: KARGER, ALLSCHWILERSTRASSE 10, CH-4009 BASEL, SWITZERLAND

Language: English Document Type: ARTICLE

Abstract: To automate sleep stage scoring, the system sleep analysis system to challenge innovative artificial networks (SASCIA) has been developed and implemented. The aims of our investigation were twofold: In addition to automatic sleep stage scoring the hypothesis was tested that the information of only 1 EEG channel (C4-A2) should be sufficient to automatically generate sleep profiles which are comparable with profiles made by sleep experts on the basis of at least 3-channel EEG (C4-A2), EOG and EMG, as EOG and EMG are seen as epiphenomena during sleep and the full information about the sleep stage should - according to our hypothesis - be available in the EEG. The main components of the SASCIA sleep analysis system are designed to meet the requirements of flexible adaptation to the interindividual differences of the sleep EEG. **The core of the SASCIA sleep analysis system consists of neural**

**networks** . Supervised learning was implemented and the experts' scorings were included into the learning set and test set, The feature selections out of a large number(118) are performed by genetic algorithms and the topologies of the networks are optimized by evolutionary algorithms, Different mathematical procedures were used to evaluate and optimize the efficiency of the system. The profiles generated by SASCIA are in reasonable agreement with the sleep stages scored by experts according to RKR, The development of the system is communicated in three parts: the first communication deals with the application of the **neural network** techniques using evolutionary and genetic algorithms and with the selection of feature space. The second communication shows the training of these evolutionary optimized network techniques with multiple subjects and the application of context rules! while the third communication shows an improvement in the robustness by the simultaneous application of 9 different networks obtained from 9 subject types which were used in combination with context rules.

12/7/9 (Item 9 from file: 34)

DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

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06203452 Genuine Article#: YB419 Number of References: 31

**A predictive morphometric model for the obstructive sleep apnea syndrome**

Author(s): Kushida CA (REPRINT) ; Efron B; Guilleminault C

Corporate Source: STANFORD UNIV,SLEEP DISORDERS CLIN & RES CTR, 401 QUARRY RD, SUITE 3301-A/STANFORD//CA/94305 (REPRINT)

Journal: ANNALS OF INTERNAL MEDICINE, 1997, V127, N8,1 (OCT 15), P581-&

ISSN: 0003-4819 Publication date: 19971015

Publisher: AMER COLL PHYSICIANS, INDEPENDENCE MALL WEST 6TH AND RACE ST, PHILADELPHIA, PA 19106-1572

Language: English Document Type: ARTICLE

Abstract: Background: Mathematical formulas have been used to clinically predict whether patients will develop the obstructive steep apnea syndrome (OSAS). However, these models do not take into account the disproportionate craniofacial anatomy that accompanies OSAS independently of obesity.

Objective: To determine the accuracy of a morphometric model, which combines measurements of the oral cavity with body mass index and neck circumference, in predicting whether a patient has OSAS.

Design: 6-month prospective study.

Setting: University-based tertiary referral sleep clinic and research center.

Participants: 300 consecutive patients evaluated for sleep disorders for the first time.

Measurements: Body mass index, neck circumference, and oral cavity measurements were obtained, and a model value was calculated for each patient. Polysomnography was used to determine the number of abnormal respiratory events that occurred during sleep. Sleep apnea was defined as more than five episodes of apnea or hypopnea per hour of sleep.

Results: The morphometric model had a sensitivity of 97.6% (95% CI, 95% to 98.9%), a specificity of 100% (CI, 92% to 100%), a positive predictive Value of 100% (CI, 98.5% to 100%), and a negative predictive value of 88.5% (CI, 77% to 96%). No significant discrepancies were revealed in tests of intermeasurer and test-retest reliability.

Conclusions: The morphometric model provides a rapid, accurate, and reproducible method for predicting whether patients in an ambulatory

setting have OSAS. The model may be clinically useful as a screening tool for OSAS rather than as a replacement for polysomnography.

12/7/10 (Item 10 from file: 34)

DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

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05753064 Genuine Article#: WV603 Number of References: 17

**Title: How should the multiple sleep latency test be analyzed?**

Author(s): Pollak CP (REPRINT)

Corporate Source: OHIO STATE UNIV, DEPT NEUROL, DIV SLEEP MED, 105 UPHAM  
HALL/COLUMBUS//OH/43210 (REPRINT)

Journal: SLEEP, 1997, V20, N1 (JAN), P34-39

ISSN: 0161-8105 Publication date: 19970100

Publisher: AMER SLEEP DISORDERS ASSOC, 1610 14TH STREET NW SUITE 300,  
ROCHESTER, MN 55806

Language: English Document Type: ARTICLE

**Abstract:** Results of the multiple sleep latency test (MSLT) are commonly recorded as 4-5 latencies to sleep onset, together with their mean. The suitability of these and other MSLT measures of daytime sleep tendency was examined in 111 non-narcoleptic patients of a sleep disorders center.

Sleep and breathing patterns had been recorded for one night, followed by a five-nap MSLT. It was found that MSLT latencies to sleep stages 1 and 2 were distributed non-normally. There was typically an excessive frequency of long latencies and a secondary peak at 20 minutes, the longest allowed latency. Wake efficiencies (WE) (100 - % time asleep) were similarly distributed. Mean sleep latencies (SL) and mean WE were generally distributed more normally than the corresponding medians. Regression analysis showed that the MSLT variables best predicted by sleep-disordered breathing during the previous night were those based on WE. Effects were greatest for the first 1-2 naps. Whether the 4- or 5-nap MSLT can be shortened will depend on corroborating data from other labs. For now, mean WE appears to be the best measure of daytime sleep tendency. Regardless of which MSLT measure is used, sleep-disordered breathing, nocturnal sleep time, age, and gender together explain less than one-fourth of the variance found in the non-narcoleptic patients of a sleep disorders center. Much daytime sleepiness therefore remains unexplained.

12/7/11 (Item 11 from file: 34)

DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

(c) 2003 Inst for Sci Info. All rts. reserv.

05724771 Genuine Article#: WT732 Number of References: 58

**Heart rate variability in patients with daytime sleepiness suspected of having sleep apnoea syndrome: A receiver-operating characteristic analysis**

Author(s): Keyl C (REPRINT) ; Lemberger P; Pfeifer M; Hochmuth K; Geisler P

Corporate Source: UNIV REGENSBURG, ANASTHESIOLOGIE KLIN, FRANZ JOSEF STRAUSS

ALLEE 11/D-93042 REGENSBURG//GERMANY/ (REPRINT); KLINIKUM UNIV  
REGENSBURG, ANASTHESIOLOGIE KLIN/REGENSBURG//GERMANY//; KLINIKUM UNIV  
REGENSBURG, KLIN & POLIKLIN INNERE MED 2/REGENSBURG//GERMANY//;  
BEZIRKSKRANKENHAUS REGENSBURG, /REGENSBURG//GERMANY/

Journal: CLINICAL SCIENCE, 1997, V92, N4 (APR), P335-343

ISSN: 0143-5221 Publication date: 19970400

Publisher: PORTLAND PRESS, 59 PORTLAND PLACE, LONDON, ENGLAND W1N 3AJ

Language: English Document Type: ARTICLE

**Abstract:** 1. Periodic breathing is known to be associated with cyclic

fluctuations in heart rate, The purpose of this study was to evaluate the capability of spectral analysis of heart rate variability to identify episodes with periodic breathing in patients suspected of having sleep apnoea syndrome.

2. Forty-eight subjects complaining of chronic daytime sleepiness were studied using polysomnography and additional monitoring of Holter-ECG and synchronized pulse oximetry, The recordings were divided into 20 min episodes which were identified as recordings registered during normal breathing, periodic breathing, and periods of both normal and abnormal breathing. Power spectral analysis was performed on episodes which met the criteria of stationarity of data (313 episodes with normal breathing, 264 episodes with continuous periodic breathing, 80 episodes with both normal and periodic breathing patterns).

3. The ability of parameters, derived from analysis of heart rate variability, to discriminate between episodes with normal and periodic breathing was assessed by receiver-operating characteristic analysis.

4. The spectral power component in the frequency range 0.01-0.07 Hz revealed the greatest accuracy for discriminating between normal and periodic breathing (area under the receiver-operating characteristic curve = 0.929; standard error = 0.009). The analysis of the episodes classified as false-positive at a given test sensitivity of 90% and a corresponding specificity of 77% revealed that half of these episodes had been recorded during transient central nervous arousal reactions related to periodic leg movements or heavy snoring.

5. We concluded that power spectral analysis of heart rate variability offers a possible means of identifying episodes of sleep-related breathing disorders or periodic leg movements. Therefore, analysis of heart rate variability may be a valuable additional diagnostic tool in patients undergoing Holter-ECG recording.

12/7/15 (Item 15 from file: 8)

DIALOG(R)File 8:EI Compendex(R)

(c) 2003 Elsevier Eng. Info. Inc. All rts. reserv.

04381343 E.I. No: EIP96043137482

Title: IEE Colloquium on Sleep Monitoring

Author: Anon (Ed.)

Conference Title: IEE Colloquium on Sleep Monitoring

Conference Location: London, UK Conference Date: 19951114

E.I. Conference No.: 44500

Source: IEE Colloquium (Digest)n 241 1995. IEE, Stevenage, Engl. Var paging

Publication Year: 1995

CODEN: DCILDN ISSN: 0963-3308

Language: English

Document Type: CP; (Conference Proceedings) Treatment: A;  
(Applications); T; (Theoretical); X; (Experimental)

Journal Announcement: 9606W1

Abstract: The proceedings contains 6 papers. Topics discussed include sleep monitoring, driver sleepiness, **neural networks applications in EEG analysis**, non-EEG assessment of arousal in respiratory sleep disorders, methods of assessing snoring, and intelligent nasal **continuous positive airway pressure** systems.

12/7/16 (Item 16 from file: 34)

DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

(c) 2003 Inst for Sci Info. All rts. reserv.

00335707 Genuine Article#: DH880 Number of References: 36

File 98:General Sci Abs/Full-Text 1984-2003/Jul  
File 9:Business & Industry(R) Jul/1994-2003/Sep 01  
File 16:Gale Group PROMT(R) 1990-2003/Sep 02  
File 160:Gale Group PROMT(R) 1972-1989  
File 148:Gale Group Trade & Industry DB 1976-2003/Sep 02  
File 621:Gale Group New Prod.Annou.(R) 1985-2003/Sep 02  
File 149:TGG Health&Wellness DB(SM) 1976-2003/Aug W3  
File 636:Gale Group Newsletter DB(TM) 1987-2003/Sep 02  
File 441:ESPICOM Pharm&Med DEVICE NEWS 2003/Aug W5  
File 20:Dialog Global Reporter 1997-2003/Sep 03  
Set Items Description  
S1 21008 NEURAL()NETWORK? ?  
S2 316749 VENTILAT? OR RESPIRAT?  
S3 2371 CPAP OR CONTINUOUS() POSITIVE() AIRWAY? ?() PRESSURE  
S4 210 KOHONEN  
S5 48 CEPSTRUM  
S6 50 INVERSE() FAST() FOURIER() TRANSFORM?  
**S7 2 S1(S)S3**  
S8 0 S7 AND S4:S6  
S9 34 S1(S)S2  
S10 0 S9 AND S4:S6  
S11 34 S9  
S12 31 RD (unique items)  
**S13 31 Sort S12/ALL/PD,D**  
S14 69 S1(S)S4:S6  
S15 6375654 ADVANTAGE? OR BENEFIT? ?  
S16 9 S14(S)S15  
**S17 4 RD (unique items)**  
S18 60 S14 NOT S16  
S19 52 RD (unique items)  
S20 19 S19/AB,DE,TI  
S21 19 S20 NOT S16  
**S22 19 Sort S21/ALL/PD,D**

7/3,AB,K/1 (Item 1 from file: 149)

DIALOG(R)File 149:TGG Health&Wellness DB(SM)

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01853703 SUPPLIER NUMBER: 55653615 (USE FORMAT 7 OR 9 FOR FULL TEXT)

**Neural Network Prediction of Obstructive Sleep Apnea From Clinical  
Criteria(\*)**

Kirby, Simon D.; Eng, P; Danter, Wayne; George, Charles F. P.; Francovic,  
Tanya; Ruby, Ralph R. F.; Ferguson, Kathleen A.

Chest, 116, 2, 409

August, 1999

PUBLICATION FORMAT: Magazine/Journal; Refereed ISSN: 0012-3692

LANGUAGE: English RECORD TYPE: Fulltext TARGET AUDIENCE: Professional

WORD COUNT: 5304 LINE COUNT: 00538

... office setting.

This study differs from other screening studies because of the use of  
the **neural network**. If the **neural network** could accurately rule in  
or rule out OSA, then the PSG could be eliminated from...

...saving valuable resources, potentially from some OSA subjects who might  
proceed to a therapeutic study ( **continuous positive airway pressure**  
trial) instead of a diagnostic study. Given that OSA has significant  
consequences, physicians would not...

...was 98.9% (95% CI, 96.7 to 100). The most important measure of the

**neural network** as a screening instrument is the high sensitivity coupled with the low false-negative rate. The **neural network** misclassified only 1 out of 150 cases as not having OSA when the AHI was...  
...10.5 events per hour, a very low level of OSA. This suggests that the **neural network** does not miss serious cases of OSA when it does make a mistake. Only 19...  
...unnecessary PSG testing. Overall, 48 patients (39.8%) would not have required PSG based on the **neural network** prediction. Although a specific cost analysis was not performed in this study, it is apparent...

**7/3,AB,K/2 (Item 2 from file: 149)**

DIALOG(R)File 149:TGG Health&Wellness DB(SM)

(c) 2003 The Gale Group. All rts. reserv.

01848252 SUPPLIER NUMBER: 55332475 (USE FORMAT 7 OR 9 FOR FULL TEXT)

**Impaired Swallowing Reflex in Patients With Obstructive Sleep Apnea Syndrome (\*)**

Teramoto, Shinji; Sudo, Eiichi; Matsuse, Takeshi; Ohga, Eihiro; Ishii, Takeo; Ouchi, Yasuyoshi; Fukuchi, Yoshinosuke  
Chest, 116, 1, 17  
July, 1999

PUBLICATION FORMAT: Magazine/Journal; Refereed ISSN: 0012-3692

LANGUAGE: English RECORD TYPE: Fulltext TARGET AUDIENCE: Professional

WORD COUNT: 3401 LINE COUNT: 00303

... oropharynx have been thought to play an important role in apnea termination. (18,19) Nasal **continuous positive airway pressure** (nCPAP) has been established as the first line of therapy for OSAS; it has been...

...or chemical stimuli, including apnea and positive pressures in the upper airways. Because abnormalities of **neural networks** in the area of the suprapharynx are implicated in the cause and/or results of...

**13/8/1 (Item 1 from file: 149)**

DIALOG(R)File 149:(c) 2003 The Gale Group. All rts. reserv.

02138609 SUPPLIER NUMBER: 96501825 (USE FORMAT 7 OR 9 FOR FULL TEXT)

**Breathtaking science: biologists home in on the brain area that drives respiration.**

2003

WORD COUNT: 2472 LINE COUNT: 00198

DESCRIPTORS: Respiration--Research; Brain stem--Research

GEOGRAPHIC CODES/NAMES: 1USA United States

EVENT CODES/NAMES: 310 Science & research

**13/8/2 (Item 2 from file: 149)**

DIALOG(R)File 149:(c) 2003 The Gale Group. All rts. reserv.

02153557 SUPPLIER NUMBER: 98079170 (USE FORMAT 7 OR 9 FOR FULL TEXT)

**Selection of input features across subjects for classifying crewmember workload using artificial neural networks. (Abstract)**

2002

DESCRIPTORS: Neural networks--Research; Object recognition (Computers)--Research; Pattern recognition; Psychophysiology--Research

EVENT CODES/NAMES: 310 Science & research

**13/8/6 (Item 6 from file: 16)**

DIALOG(R)File 16:(c) 2003 The Gale Group. All rts. reserv.

07690662 Supplier Number: 63988383 (USE FORMAT 7 FOR FULLTEXT)

**Computer Offers a Second Opinion on Chest Radiographs.**

August 15, 2000  
Word Count: 275  
PUBLISHER NAME: Charles W. Henderson

**13/8/9 (Item 9 from file: 16)**

DIALOG(R)File 16:(c) 2003 The Gale Group. All rts. reserv.  
06783170 Supplier Number: 57006877 (USE FORMAT 7 FOR FULLTEXT)  
**Pathophysiology and pharmacotherapy of nausea and emesis.**  
Oct 18, 1999  
Word Count: 5427  
PUBLISHER NAME: Medical Economics Company, Inc.  
EVENT NAMES: \*310 (Science & research)  
GEOGRAPHIC NAMES: \*1USA (United States)  
PRODUCT NAMES: \*2830000 (Drugs & Pharmaceuticals)  
INDUSTRY NAMES: BUSN (Any type of business); DRUG (Pharmaceuticals and Cosmetics)  
NAICS CODES: 3254 (Pharmaceutical and Medicine Manufacturing)  
SPECIAL FEATURES: INDUSTRY

**13/8/15 (Item 15 from file: 98)**

DIALOG(R)File 98:(c) 2003 The HW Wilson Co. All rts. reserv.  
04032487 H.W. WILSON RECORD NUMBER: BGSA99032487  
**RVLM and raphe differentially regulate sympathetic outflows to splanchnic and brown adipose tissue.**  
DESCRIPTORS:  
Brown adipose tissue; Brain--Localization of function; Sympathetic nervous system--Physiology; Medulla oblongata  
Apr. 1999 pt2 (19990400)

**13/8/16 (Item 16 from file: 149)**

DIALOG(R)File 149:(c) 2003 The Gale Group. All rts. reserv.  
01721657 SUPPLIER NUMBER: 19831772 (USE FORMAT 7 OR 9 FOR FULL TEXT)  
**Pulmonary embolism: the diagnostic repertoire.(Editorial)**  
1997  
WORD COUNT: 2102 LINE COUNT: 00182  
DESCRIPTORS: Pulmonary embolism--Diagnosis; Diagnosis--Standards

**13/8/18 (Item 18 from file: 98)**

DIALOG(R)File 98:(c) 2003 The HW Wilson Co. All rts. reserv.  
03518407 H.W. WILSON RECORD NUMBER: BGSI97018407 (USE FORMAT 7 FOR FULLTEXT)  
**Coordinated control of respiratory pattern during locomotion in birds**  
WORD COUNT: 6250  
DESCRIPTORS:  
Respiratory system--Physiology; Birds--Flight  
'97 (19970000)

**13/8/19 (Item 19 from file: 636)**

DIALOG(R)File 636:(c) 2003 The Gale Group. All rts. reserv.  
03253912 Supplier Number: 46675817 (USE FORMAT 7 FOR FULLTEXT)  
**From the Editor: INTELLIGENT SENSOR ARRAYS COULD ADVANCE IAQ MONITORING**  
Sept 1, 1996  
Word Count: 1532  
PUBLISHER NAME: Vital Information Publications  
INDUSTRY NAMES: BUSN (Any type of business); ELEC (Electronics)

13/8/22 (Item 22 from file: 98)

DIALOG(R)File 98:(c) 2003 The HW Wilson Co. All rts. reserv.  
03265317 H.W. WILSON RECORD NUMBER: BGS196015317

**Respiratory modulation of sympathetic nerve activity: effect of MK-801.**

DESCRIPTORS:

NMDA receptors; Respiratory system; Splanchnic nerves  
Mar. '96 pt2 (19960300)

13/8/23 (Item 23 from file: 148)

DIALOG(R)File 148:(c)2003 The Gale Group. All rts. reserv.  
07525373 SUPPLIER NUMBER: 16096879 (USE FORMAT 7 OR 9 FOR FULL TEXT)

**What is neural network software? (Cutting Edge)**

Sept, 1994

WORD COUNT: 3158 LINE COUNT: 00256

INDUSTRY CODES/NAMES: BUS Business, General; CMPT Computers and  
Office Automation

DESCRIPTORS: Neural networks--Usage; Artificial intelligence--Usage

13/8/26 (Item 26 from file: 98)

DIALOG(R)File 98:(c) 2003 The HW Wilson Co. All rts. reserv.  
02542418 H.W. WILSON RECORD NUMBER: BGS193042418

**Cerebrovasodilation elicited by fastigial stimulation is preserved under  
deep halothane anesthesia.**

DESCRIPTORS:

Vasodilation; Halothane; Brain--Blood flow  
July '93 pt2 (19930700)

13/8/30 (Item 30 from file: 636)

DIALOG(R)File 636:(c) 2003 The Gale Group. All rts. reserv.  
01536394 Supplier Number: 42222278 (USE FORMAT 7 FOR FULLTEXT)

**HITACHI AUTOMATES FUZZY INDUSTRIAL SYSTEM DEVELOPMENT**

July 15, 1991

Word Count: 241

PUBLISHER NAME: Kyodo News International, Inc.

INDUSTRY NAMES: BUSN (Any type of business); INTL (Business,  
International)

13/3,AB,K/3 (Item 3 from file: 149)

DIALOG(R)File 149:TGG Health&Wellness DB(SM)  
(c) 2003 The Gale Group. All rts. reserv.

02136440 SUPPLIER NUMBER: 94930908 (USE FORMAT 7 OR 9 FOR FULL TEXT)

**Prediction of emergency department visits for respiratory symptoms using  
an artificial neural network . \***

Bibi, Haim; Nutman, Amir; Shoseyov, David; Shalom, Mendel; Peled, Ronit;  
Kivity, Shmuel; Nutman, Jacob  
Chest, 122, 5, 1627(6)

Nov, 2002

PUBLICATION FORMAT: Magazine/Journal; Refereed ISSN: 0012-3692

LANGUAGE: English RECORD TYPE: Fulltext TARGET AUDIENCE: Professional

WORD COUNT: 4402 LINE COUNT: 00365

... setting: To predict ED visits, we have created a computer-based  
model called an artificial **neural network** (ANN) using a  
back-propagation training algorithm and genetic algorithm optimization.  
This ANN was fed...

...input variables and trained to predict the number of patients admitted  
to the ED with **respiratory** symptoms of asthma, COPD, and acute and



chronic bronchitis on the corresponding day. One thousand...  
...to a network training set (n = 816) and a test set (n = 204). Results:  
The **neural network** performed best when the predictor variables used  
were temperature, relative humidity, barometric pressure, S(O...  
...to ED admission and the average during the 7 days before the ED visit.  
The **neural network** was able to predict the test set with an average  
error of 12%. Conclusion: Based...  
...the use of an ANN can assist in the prediction of ED visits related to  
**respiratory** conditions. (CHEST 2002; 122:1627-1632)

Key words: artificial **neural networks** ; emergency department;  
**respiratory** symptoms

Abbreviations: ANN = artificial neural network; ED = emergency  
department; GA = genetic algorithm; NOx = oxidation products...  
...these exacerbations. We attempted to develop a mathematical model for  
predicting respiratory symptom exacerbations using **neural network**  
technology.

Artificial neural networks (ANNs) are computer-based algorithms  
inspired by the structure and behavior...based on meteorologic and air  
pollution data. The next logical step would be to use **neural networks**  
to predict exacerbations in individual patients. **Neural network**  
technology is readily available in numerous software packages that  
physicians could use and custom tailor...

13/3,AB,K/4 (Item 4 from file: 149)  
DIALOG(R)File 149:TGG Health&Wellness DB(SM)  
(c) 2003 The Gale Group. All rts. reserv.  
02111968 SUPPLIER NUMBER: 93087810 (USE FORMAT 7 OR 9 FOR FULL TEXT)  
Automated breath detection on long-duration signals using feedforward  
backpropagation artificial neural networks. (Abstract)

Sa, Rui Carlos; Verbandt, Yves

IEEE Transactions on Biomedical Engineering, 49, 10, 1130(12)  
Oct, 2002

DOCUMENT TYPE: Abstract PUBLICATION FORMAT: Magazine/Journal; Refereed  
ISSN: 0018-9294 LANGUAGE: English RECORD TYPE: Abstract  
TARGET AUDIENCE: Academic; Professional; Trade

AUTHOR ABSTRACT: A new breath-detection algorithm is presented, intended  
to automate the analysis of respiratory data acquired during sleep. The  
algorithm is based on two independent artificial **neural networks**  
(AN(N.sub.insp) and AN(N.sub.expi)) that recognize, in the original signal,  
windows of interest where the onset of inspiration and expiration occurs.  
Postprocessing consists in finding inside each of these windows of interest  
minimum and maximum corresponding to each inspiration and expiration. The  
AN(N.sub.insp) and AN(N.sub.expi) correctly determine respectively 98.0%  
and 98.7% of the desired windows, when compared with 29 820 inspirations  
and 29 819 expirations detected by a human expert, obtained from three  
entire-night recordings. Postprocessing allowed determination of  
inspiration and expiration onsets with a mean difference with respect to  
the same human expert of (mean (+ or -) SD) 34 (+ or -) 71 ms for  
inspiration and 5 (+ or -) 46 ms for expiration. The method proved to be  
effective in detecting the onset of inspiration and expiration in full  
night continuous recordings. A comparison of five human experts performing  
the same classification task yielded that the automated algorithm was  
undifferentiable from these human experts, falling within the distribution  
of human expert results. Besides being applicable to adult **respiratory**  
volume data, the presented algorithm was also successfully applied to  
infant sleep data, consisting of uncalibrated rib cage and abdominal

movement recordings. A comparison with two previously published algorithms for breath detection in **respiratory** volume signal shows that the presented algorithm has a higher specificity, while presenting similar or higher positive predictive values.

Index Terms--Artificial **neural networks** , breath detection, **respiration** , **respiratory** movements, sleep.

13/3,AB,K/5 (Item 5 from file: 149)

DIALOG(R)File 149:TGG Health&Wellness DB(SM)

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02106220 SUPPLIER NUMBER: 91399506 (USE FORMAT 7 OR 9 FOR FULL TEXT)

**A novel method for the detection of apnea and hypopnea events in respiration signals. (Abstract)**

Varady, Peter; Micsik, Tamas; Benedek, Sandor; Benyo, Zoltan

IEEE Transactions on Biomedical Engineering, 49, 9, 936(7)

Sept, 2002

DOCUMENT TYPE: Abstract PUBLICATION FORMAT: Magazine/Journal; Refereed

ISSN: 0018-9294 LANGUAGE: English RECORD TYPE: Abstract

TARGET AUDIENCE: Academic; Professional; Trade

AUTHOR ABSTRACT: The monitoring of breathing dynamics is an essential diagnostic tool in various clinical environments, such as sleep diagnostics, intensive care and neonatal monitoring. This paper introduces an innovative signal classification method that is capable of on-line detection of the presence or absence of normal breathing. Four different artificial **neural networks** are presented for the recognition of three different patterns in the **respiration** signals (normal breathing, hypopnea, and apnea). Two networks process the normalized **respiration** signals directly, while another two use sophisticatedly preprocessed signals. The development of the networks was based on training sets from the polysomnographic records of nine different patients. The detection performance of the networks was tested and compared by using up to 8000 untrained breathing patterns from 16 different patients. The networks which classified the preprocessed **respiration** signals produced an average detection performance of over 90%. In the light of the moderate computational power used, the presented method is not only viable in clinical polysomnographs and **respiration** monitors, but also in portable devices.

Index Terms--Classification, **neural networks** , polysomnography, **respiration** monitoring, sleep apnea.

13/3,AB,K/7 (Item 7 from file: 149)

DIALOG(R)File 149:TGG Health&Wellness DB(SM)

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01900242 SUPPLIER NUMBER: 61635216 (USE FORMAT 7 OR 9 FOR FULL TEXT)

**Sleep in Critically III Patients Requiring Mechanical Ventilation(\*)**

Cooper, Andrew B.; Thornley, Kristine S.; Young, G. Bryan; Slutsky, Arthur S.; Stewart, Thomas E.; Hanly, Patrick J.

Chest, 117, 3, 809

March, 2000

PUBLICATION FORMAT: Magazine/Journal; Refereed ISSN: 0012-3692

LANGUAGE: English RECORD TYPE: Fulltext TARGET AUDIENCE: Professional

WORD COUNT: 6207 LINE COUNT: 00561

... environment.(5,11)

An important limitation of our methodology for assessment of sleep in mechanically **ventilated** patients is the considerable time and resources required to manually score 24-h PSG studies and to comprehensively assess

sleep-disrupting factors such as care activities, noise, and the patient-**ventilator** interaction. These shortcomings should be addressed in future investigations. One approach is the use of computerized **neural network** processing of PSG data, which has advantages of reproducibility and speed.(40) Another would be...  
...characteristics of self-similarity, scaling, and fractal dimension. If sleep fragmentation in critically ill, mechanically **ventilated** patients has such characteristics, it might be possible to derive conclusions from a smaller subset...

**13/3,AB,K/8 (Item 8 from file: 149)**  
DIALOG(R)File 149:TGG Health&Wellness DB(SM)  
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01873368 SUPPLIER NUMBER: 57892912 (USE FORMAT 7 OR 9 FOR FULL TEXT)  
**Neural Network Analysis of the Volumetric Capnogram to Detect Pulmonary Embolism(\*)**.  
Patel, Manish M.; Rayburn, Daniel B.; Browning, Jane A.; Kline, Jeffrey A.  
Chest, 116, 5, 1325  
Nov, 1999  
PUBLICATION FORMAT: Magazine/Journal; Refereed ISSN: 0012-3692  
LANGUAGE: English RECORD TYPE: Fulltext TARGET AUDIENCE: Professional  
WORD COUNT: 6326 LINE COUNT: 00663  
TEXT:

...be manifested in various variables of the volume-based capnogram (VBC). We hypothesized that a **neural network** (NN) system could detect changes in VBC variables that reflect the presence of a PE.  
... words: artificial intelligence; capnography; diagnosis; pulmonary embolism; respiratory monitoring; thromboembolism  
Abbreviations: CI = confidence interval; NN = **neural network** ; PAG = pulmonary angiography; PE = pulmonary embolism; TI = inspiratory time; VBC = volume-based capnogram; VE = minute **ventilation** ; V/Q = **ventilation** /perfusion ratio; VT = tidal volume  
The process of distinguishing patients with pulmonary embolism (PE) from...

**13/3,AB,K/10 (Item 10 from file: 149)**  
DIALOG(R)File 149:TGG Health&Wellness DB(SM)  
(c) 2003 The Gale Group. All rts. reserv.  
01869045 SUPPLIER NUMBER: 57562584 (USE FORMAT 7 OR 9 FOR FULL TEXT)  
**Predicting Active Pulmonary Tuberculosis Using an Artificial Neural Network(\*)**.  
El-Solh, Ali A.; Hsiao, Chiu-Bin; Goodnough, Susan; Serghani, Joseph;  
Grant, Brydon J. B.  
Chest, 116, 4, 968  
Oct, 1999  
PUBLICATION FORMAT: Magazine/Journal; Refereed ISSN: 0012-3692  
LANGUAGE: English RECORD TYPE: Fulltext TARGET AUDIENCE: Professional  
WORD COUNT: 4205 LINE COUNT: 00369  
... 5 refused diagnostic bronchoscopy. Five hundred sixty-three consecutive patients were used to design the **neural network** and were referred to as the derivation set. The remaining 119 patients formed the validation...

**13/3,AB,K/21 (Item 21 from file: 149)**  
DIALOG(R)File 149:TGG Health&Wellness DB(SM)  
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01615883 SUPPLIER NUMBER: 18137555 (USE FORMAT 7 OR 9 FOR FULL TEXT)

**Diagnosis of pulmonary embolism by a decision analysis-based strategy including clinical probability, D-dimer levels, and ultrasonography: a management study.**

Perrier, Arnaud; Bounameaux, Henri; Morabia, Alfredo; De Moerloose, Philippe; Slosman, Daniel; Didier, Dominique; Unger, Pierre-Francois; Junod, Alain

Archives of Internal Medicine, v156, n5, p531(6)

March 11, 1996

PUBLICATION FORMAT: Magazine/Journal ISSN: 0003-9926 LANGUAGE: English

RECORD TYPE: Fulltext; Abstract TARGET AUDIENCE: Professional

WORD COUNT: 4133 LINE COUNT: 00361

AUTHOR ABSTRACT: Background: Assessment of the clinical probability of pulmonary embolism, plasma D-dimer measurement, and lower-limb venous compression ultrasonography have all been advocated in the workup of suspected pulmonary embolism, to minimize the requirement for pulmonary angiography in patients with nondiagnostic lung scans. However, their contribution has not been assessed prospectively. Methods: Three hundred eight consecutive patients who came to the emergency department with suspected pulmonary embolism were managed according to a diagnostic protocol that included clinical probability assessment, lung scan, and sequential noninvasive tests: plasma D-dimer measurement by enzyme-linked immunosorbent assay (a concentration <500[mu]g/L ruled out pulmonary embolism) and lower-limb B-mode venous compression ultrasonography (a positive finding was diagnostic of venous thromboembolism). Patients without pulmonary embolism according to the diagnostic workup did not receive anticoagulant treatment. The safety of this approach was assessed by a 6-month follow-up. Results: Of the 308 patients, 106 (34%) had a diagnostic lung scan (normal in 43 and high probability in 63). For the remaining 202 patients, noninvasive workup was diagnostic in 123 (62%). Pulmonary embolism was ruled out by a low clinical probability and a nondiagnostic scan in 48 patients and a D-dimer level less than 500 [mu]/L in 53; pulmonary embolism was established by a high clinical probability and a nondiagnostic scan in seven patients and by a finding of a deep vein thrombosis on ultrasonography in 17. Therefore, only 77 of these 202 patients underwent pulmonary angiography (negative in 55; positive in 22). At 6-month follow-up (completed for 99.4% of the study population), only two of the 199 patients in whom the diagnostic protocol had ruled out pulmonary embolism (1.0% [95% confidence interval, 0.1 to 3.6]) had a thromboembolic event (pulmonary embolism, one; deep vein thrombosis, one). Conclusions: This decision analysis strategy yielded a definitive noninvasive diagnosis in 62% of patients with a nondiagnostic scan and appears to be safe.

(Arch Intern Med. 1996;156:531-536)

... means of the StatXact computer software.[23]

REFERENCES

[1.] The PIOPED Investigators. Value of the **ventilation** -perfusion scan in acute pulmonary embolism. JAMA. 1990;263:2753-2759. [2.] Moser KM. Venous...

...Intern Med. 1988;148:838-844. [10.] Patil S, Henry JW, Rubenfire M, Stein PD. **Neural network** in the clinical diagnosis of acute pulmonary embolism. Chest 1993;104:1685-1689. [11.] Bounameaux...

13/3,AB,K/24 (Item 24 from file: 149)

DIALOG(R) File 149:TGG Health&Wellness DB(SM)

(c) 2003 The Gale Group. All rts. reserv.

01484205 SUPPLIER NUMBER: 15537478 (USE FORMAT 7 OR 9 FOR FULL TEXT)

**Respiratory dyskinesia: an underrecognized phenomenon.**

Rich, Michael W.; Radwany, Steven M.

Chest, v105, n6, p1826(7)

June, 1994

PUBLICATION FORMAT: Magazine/Journal ISSN: 0012-3692 LANGUAGE: English

RECORD TYPE: Fulltext TARGET AUDIENCE: Professional

WORD COUNT: 5559 LINE COUNT: 00503

... speculations. Neurology 1990; 40:340-45 [7] Weiner WJ, Goetz CG, Nausieda PA, Klawans HL. **Respiratory** dyskinesia: extrapyramidal dysfunction and dyspnea. Ann Intern Med 1978; 88:327-31 [8] Casey DE...  
...of tardive dyskinesia. J Clin Psychiatry 1981; 42:401-03 [10] Jann MW, Bitar AH. **Respiratory** dyskinesia. Psychosomatics 1982; 23:764-65 [11] Bick PA. **Respiratory** dyskinesia [letter]. Psychosomatics 1983; 24:163-64 [12] Faheem AD, Brightwell DR, Burton GC, Struss A. **Respiratory** dyskinesia and dysarthria from prolonged neuroleptic use: tardive dyskinesia? Am J Psychiatry 1982; 139:517-18 [13] Chiang E, Pitts WM Jr, Rodriguez-Garcia M. **Respiratory** dyskinesia: review and case reports. J Clin Psychiatry 1985; 46:232-34 [14] Goswami U, Channabasavanna SM. On the lethality of the acute **respiratory** component of tardive dyskinesia. Clin Neurol Neurosurg 1985; 87:99-102 [15] Godlee FN, Brooks DJ, Impallomeni M. Dyskinesia in the elderly presenting as **respiratory** disorder. Postgrad Med 1989; 65:830-31 [16] Yassa R, Lal S. **Respiratory** irregularity and tardive dyskinesia: a prevalence study. Acta Psychiatr Scand 1986; 73:506-10 [17] Chiu HF, Chan LS, Misdiagnosis of **respiratory** dyskinesia. Acta Psychiatr Scand 1991; 83:494-95 [18] Nakamura J, Otsuka M, Kuniyoshi M, Inanaga K. Three cases of **respiratory** dyskinesia. Jpn J Psychiatr Neurol 1991; 45:833-41 [19] Sakamoto J, Hayasaka K. A case of **respiratory** dyskinesia. Clin Psychiatr 1987; 29:433-35 [20] Inada T, Yagi G, Kaijima K, Ohniski...  
...1991; 45:67-71 [21] Hirata I, Oda K, Kuroda Y, Shibasaki H. Trihexphenidyl-induced **respiratory** dyskinesia. Clin Neurol 1986; 26:109-14 [22] Holmes VF, Adams F, Fernandez F. **Respiratory** dyskinesia due to antiemetic therapy in a cancer patient. Cancer Treat Rep 1987; 71:415...  
...R Soc Med 1964; 57:24-8 [25] Youssef HA, Waddington JL. Characterization of abnormal **respiratory** movement in schizophrenic, bipolar, and mentally handicapped patients with typical tardive dyskinesia. Int Clin Psychopharmacol 1989; 4:55-9 [26] Jackson IV, Volavka J, James B, Reker D. The **respiratory** components of tardive dyskinesia. Biol Psychiatry 1980; 15:485-87 [27] Jankovic J, Nour F. **Respiratory** dyskinesia in Parkinson's disease. Neurology 1986; 36:303-04 [28] DeKeyser J, Vincken W. L-dopa-induced **respiratory** disturbance in Parkinson's disease suppressed by tiapride. Neurology 1985; 35:235-37 [29] Granerus AK, Jagenburg R, Nilsson NJ, Svanborg A. **Respiratory** disturbance during L-dopa treatment of Parkinson's syndrome. Acta Med Scand 1974; 195:39...  
...Arch Gen Psychiatry 1982; 39:466-69 [33] Mitchell RA, Berger AJ. Neural regulation of **respiration**. Am Rev Respir Dis 1975; 3:206-24 [34] Alexander GE, Crutcher MD. Functional architecture...  
...the basal ganglia. Trends Neurosci 1990; 13:254-58 [36] Smith AD, Bolam JP. The **neural network** of the basal ganglia as revealed by the study of synaptic connections of identified neurones. Trends Neurosci 1990; 13:259-65 [37] Colice GL, Bernat JL. Neurologic disorders and **respiration**. Clin Chest Med 1989; 10:521-43 [38] Nutt JG, Woodward WR, Hammerstad JP, Carter disease. Mayo Clin Proc 1988; 63:876-86 [40] Cohen JJ, Madias NE. **Respiratory** alkalosis and acidosis. In: Seldin DW, Giebisch G. eds. The

kidney: physiology and pathophysiology. New...

13/3,AB,K/25 (Item 25 from file: 149)  
DIALOG(R)File 149:TGG Health&Wellness DB(SM)  
(c) 2003 The Gale Group. All rts. reserv.  
01434387 SUPPLIER NUMBER: 14707278 (USE FORMAT 7 OR 9 FOR FULL TEXT)  
**Neural network in the clinical diagnosis of acute pulmonary embolism.**  
Patil, Sanjay; Henry, Jerald W.; Rubenfire, Melvyn; Stein, Paul D.  
Chest, v104, n6, p1685(5)  
Dec, 1993  
PUBLICATION FORMAT: Magazine/Journal ISSN: 0012-3692 LANGUAGE: English  
RECORD TYPE: Fulltext TARGET AUDIENCE: Professional  
WORD COUNT: 3153 LINE COUNT: 00254  
TEXT:

...and arterial blood gases of patients with suspected acute PE were presented to a backpropagation **neural network**. The 1,213 patients were divided into training set A (n = 606) and test set...  
...606). A receiver operating characteristic (ROC) curve was constructed from PIOPED clinical assessment, and from **neural network** clinical assessment in groups A and B. Areas under the respective ROC curves were 0...  
...All differences were not significant. Areas under ROC curves for PIOPED clinical assessment combined with **ventilation** /perfusion (V/Q) scan results were compared with **neural network** clinical assessment combined with V/Q scan results in groups A and B. The respective...  
...were 0.8324, 0.8203, 0.8496 (all differences not significant). These data show that **neural networks** were able to predict the clinical likelihood of PE with an accuracy comparable to experienced...  
...pulmonary embolism; PIOPED = Prospective Investigation of Pulmonary Embolism Diagnosis; ROC = receiver operating characteristic; V/Q = **ventilation** /perfusion  
... physicians knowledgeable and experienced in the diagnosis of acute PE.

It may be that the **neural network** would perform better if more clinical information were available to it. For example, a clinician...  
...a patient is in acute distress, and whether the patient is using accessory muscles of **respiration**. The **neural network** had available only the presence or absence of shortness of breath and the **respiratory** rate. A limitation of this study is that the **neural network** retrospectively evaluated previously obtained prospective data.

Results of previously interpreted V/Q scans were presented...  
...suspected pulmonary embolism. Chest 1985; 88:819-28 [3] Baxt WG. Use of an artificial **neural network** for the diagnosis of myocardial infarction. Ann Intern Med 1991; 115:843-48 [4] Bounds DG, Lloyd PJ. A comparison of **neural network** and other pattern recognition approaches to the diagnosis of low back disorders. **Neural Networks** 1990; 3:583-91 [5] Rumelhart DE, Hinton GE, Williams RJ. Learning internal representations by...  
...acute pulmonary embolism. Am J Cardiol 1991; 68:1723-24 [10] Scott JA, Palmer EL. **Neural network** analysis of **ventilation** -perfusion lung scans. Radiology 1993; 186:661-64 [11] Fujita H, Katafuchi T, Uehara T, Nishimura T. Application of artificial **neural network** to computer-aided diagnosis of coronary artery disease in myocardial SPECT bull's-eye images...

13/3,AB,K/27 (Item 27 from file: 149)  
DIALOG(R)File 149:TGG Health&Wellness DB(SM)  
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01416219      SUPPLIER NUMBER: 13736799      (USE FORMAT 7 OR 9 FOR FULL TEXT)  
**Artificial neural networks for predicting failure to survive following  
in-hospital cardiopulmonary resuscitation.**

Ebell, Mark H.

Journal of Family Practice, v36, n3, p297(7)

March, 1993

PUBLICATION FORMAT: Magazine/Journal    ISSN: 0094-3509    LANGUAGE: English

RECORD TYPE: Fulltext    TARGET AUDIENCE: Professional

WORD COUNT:    3422      LINE COUNT:    00338

... Three of the patients who underwent CPR and survived to discharge were misclassified by the **neural network**. These three patients were a 47-year-old man with diabetic ketoacidosis and a witnessed episode of symptomatic bradycardia; a 55-year-old man with pneumonia and a witnessed **respiratory** arrest; and a 71-year-old woman recovering from peripheral vascular surgery with an unwitnessed...

...these patients was documented as having received full resuscitative efforts, including chest compressions and artificial **ventilation**.

Discussion

The trained aggregate neural network was able to identify 52% of the patients who...

**13/3,AB,K/28      (Item 28 from file: 636)**

DIALOG(R)File 636:Gale Group Newsletter DB(TM)

(c) 2003 The Gale Group. All rts. reserv.

01948665      Supplier Number: 43445590

**Anesthesia Monitoring Developments (part 6): Expanded Use of Neural Networks**

The BBI Newsletter, v15, n11, pN/A

Nov 11, 1992

Language: English    Record Type: Fulltext

Document Type: Newsletter; Trade

Word Count:    310

... UNIVERSITY OF SOUTH FLORIDA College of Medicine (Tampa, FL) made two presentations regarding work with **neural networks** which expanded upon work they presented last year. In one, they demonstrated how a **neural network** can be used to correct the significant flow resistive component in pressure-volume curves obtained from high-flow inflations, thus allowing the derivation of on-line estimates of **respiratory** system compliance. In another, Dr. Leon indicated success in using a **neural network** to process pressure and flow data in order to determine whether an endotracheal tube was...

...esophagus during intubation. Based on the work of these two groups, it seems likely that **neural network** approaches may be implemented in commercially available monitoring products within the next few years, pending...

**13/3,AB,K/29      (Item 29 from file: 636)**

DIALOG(R)File 636:Gale Group Newsletter DB(TM)

(c) 2003 The Gale Group. All rts. reserv.

01697471      Supplier Number: 42729422

**Recent Japanese developments in electronics**

NTIS Foreign Technology Newsletter, v92, n5, pN/A

Feb 4, 1992

Language: English    Record Type: Fulltext

Document Type: Magazine/Journal; Trade

Word Count:    830

... in a period of less than one-fifth the current required time.  
The new extended **neural network** scheme may well find applications in establishing large scale fuzzy-based industrial systems, such as a **ventilation** system inside a tunnel, water supply and sewage systems, and foreign exchange or stock price...

**13/3,AB,K/31 (Item 31 from file: 149)**  
DIALOG(R)File 149:TGG Health&Wellness DB(SM)  
(c) 2003 The Gale Group. All rts. reserv.  
01256717 SUPPLIER NUMBER: 13228450 (USE FORMAT 7 OR 9 FOR FULL TEXT)  
**Sleeping and breathing. (32nd Annual Aspen Lung Conference: Chronic Respiratory Failure)**

Remmers, John E.  
Chest, v97, n3, p77S(4)  
March, 1990  
PUBLICATION FORMAT: Magazine/Journal ISSN: 0012-3692 LANGUAGE: English  
RECORD TYPE: Fulltext TARGET AUDIENCE: Professional  
WORD COUNT: 2308 LINE COUNT: 00200  
... of the neural mechanisms controlling breathing is provided in Figure 1. The notion of a **respiratory** central pattern generator, essentially a timer that paces the rhythm, now enjoys wide acceptance but...  
...Figure 1 also depicts a nonche-moreceptive influence provided by wakefulness that impinges on the **respiratory neural network**. As described below, this wakefulness influence can offset the requirement for a chemoreceptive input. In...  
...compensatory motor output in patients having primary abnormalities of the pharyngeal airway or of the **respiratory** pump, as described below...

**17/3,AB,K/3 (Item 1 from file: 148)**  
DIALOG(R)File 148:Gale Group Trade & Industry DB  
(c)2003 The Gale Group. All rts. reserv.  
06673481 SUPPLIER NUMBER: 14100259 (USE FORMAT 7 OR 9 FOR FULL TEXT)  
**Neural network applications start to look interesting as UK initiative bears fruit. (Neural Computing Applications Forum )**

Potter, Kate  
Computergram International, CGI07220007  
July 22, 1993  
ISSN: 0268-716X LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT  
WORD COUNT: 1261 LINE COUNT: 00099  
... into adulterating oil. Any application that involves pattern recognition, forecasting and complex data analysis will **benefit** from the neural approach. Some of the topics under discussion were: on-line algorithms for...  
...For three years it was part of an Esprit project named ANNIE, the Applications of **Neural Networks** in Industry in Europe. This looked at the use of **neural networks** in airline scheduling systems and the classifications of defects. It is now trying hard to...

**17/3,AB,K/4 (Item 2 from file: 148)**  
DIALOG(R)File 148:Gale Group Trade & Industry DB  
(c)2003 The Gale Group. All rts. reserv.  
04595769 SUPPLIER NUMBER: 09013879 (USE FORMAT 7 OR 9 FOR FULL TEXT)  
**Neural computing is coming: modelled on the biological brain, artificial networks hold out the promise of machines achieving human-like performance in tasks that currently stump even supercomputers.**  
Pitkanen, Risto



Finnish Trade Review, n1, p6(4)  
Feb, 1990

ISSN: 0015-2463      LANGUAGE: ENGLISH      RECORD TYPE: FULLTEXT  
WORD COUNT: 2309      LINE COUNT: 00183

... the behaviour of the network in coping with new data or tasks.

The advantage of **neural networks** is that the circuits need not be programmed. Indeed, it is hard to imagine how such a system could be programmed. Another **advantage** is that massively redundant neural nets are tolerant of damage. The elements need not even be adaptive, " Professor **Kohonen** says. If we have a vastly redundant system with its subsystems operating independently of each...

**22/8/4      (Item 4 from file: 148)**

DIALOG(R)File 148:(c)2003 The Gale Group. All rts. reserv.  
09288248      SUPPLIER NUMBER: 19138384      (USE FORMAT 7 OR 9 FOR FULL TEXT)  
**Simulator integrates neural learning. (Statistical Products and Service Solutions Inc releases Neural Connection) (Product Announcement)**

Feb 17, 1997

WORD COUNT: 588      LINE COUNT: 00052

SPECIAL FEATURES: illustration; other

COMPANY NAMES: SPSS Inc.--Product introduction

INDUSTRY CODES/NAMES: ELEC Electronics; ENG Engineering and Manufacturing; BUSN Any type of business

DESCRIPTORS: Computer software industry--Product introduction; Neural networks--Computer programs

PRODUCT/INDUSTRY NAMES: 7372414 (Business Information Management Software)

SIC CODES: 7372 Prepackaged software

TICKER SYMBOLS: SPSS

TRADE NAMES: Neural Connection (Decision support software)--Product introduction

**22/8/5      (Item 5 from file: 9)**

DIALOG(R)File 9:(c) 2003 Resp. DB Svcs. All rts. reserv.  
1665744      Supplier Number: 01665744      (USE FORMAT 7 OR 9 FOR FULLTEXT)

**Net blends models**

November 04, 1996

WORD COUNT: 397

COMPANY NAMES: TRAJAN SOFTWARE LTD

INDUSTRY NAMES: Software

PRODUCT NAMES: Artificial intelligence software (737235)

CONCEPT TERMS: All product and service information; Product introduction

GEOGRAPHIC NAMES: European Union (EUCX); United Kingdom (UNK); Western Europe (WEEX)

**22/8/7      (Item 7 from file: 98)**

DIALOG(R)File 98:(c) 2003 The HW Wilson Co. All rts. reserv.

03035862      H.W. WILSON RECORD NUMBER: BGSI95035862

**Autocorrelation of molecular surface properties for modeling corticosteroid binding globulin and cytosolic Ah receptor activity by neural networks.**

DESCRIPTORS:

Molecular recognition; Corticosteroid receptors; Chemoreceptors; Spatial analysis (Statistics)

July 26 '95 (19950726)

**22/8/9      (Item 9 from file: 16)**

DIALOG(R)File 16:(c) 2003 The Gale Group. All rts. reserv.  
03814917 Supplier Number: 45443445  
**Self-Organizing Neural Nets: A New Approach to Quality in Textiles**  
April, 1995  
PUBLISHER NAME: Textile Research Institute  
EVENT NAMES: \*350 (Product standards, safety, & recalls); 310 (Science & research)  
GEOGRAPHIC NAMES: \*4EUBL (Belgium)  
PRODUCT NAMES: \*2200000 (Textile Mill Products); 3573099 (Computer Systems NEC)  
INDUSTRY NAMES: BUSN (Any type of business); FASH (Fashion, Accessories and Textiles)  
NAICS CODES: 313 (Textile Mills); 334111 (Electronic Computer Manufacturing)  
SPECIAL FEATURES: INDUSTRY

**22/8/11 (Item 11 from file: 98)**

DIALOG(R)File 98:(c) 2003 The HW Wilson Co. All rts. reserv.  
02780298 H.W. WILSON RECORD NUMBER: BGS194030298  
**Representation of molecular electrostatic potentials by topological feature maps.**  
DESCRIPTORS:  
Neural network computers; Van der Waals forces; Conformational analysis  
June 1 '94 (19940601)

**22/8/12 (Item 12 from file: 98)**

DIALOG(R)File 98:(c) 2003 The HW Wilson Co. All rts. reserv.  
02777200 H.W. WILSON RECORD NUMBER: BGS194027200  
**Multiple site receptor modeling with a minimal spanning tree combined with a neural network.**  
DESCRIPTORS:  
Neural network computers; Computers--Environmental uses  
June '94 (19940600)

**22/8/13 (Item 13 from file: 98)**

DIALOG(R)File 98:(c) 2003 The HW Wilson Co. All rts. reserv.  
02777199 H.W. WILSON RECORD NUMBER: BGS194027199  
**Visual neural mapping technique for locating fine airborne particles sources.**  
DESCRIPTORS:  
Neural network computers; Air pollution--Detection and monitoring; Computers--Environmental uses  
June '94 (19940600)

**22/8/15 (Item 15 from file: 148)**

DIALOG(R)File 148:(c)2003 The Gale Group. All rts. reserv.  
07031128 SUPPLIER NUMBER: 16031038  
**Image compression using neural networks.**  
Spring, 1994  
SPECIAL FEATURES: illustration; photograph; chart; table  
INDUSTRY CODES/NAMES: ELEC Electronics; ENG Engineering and Manufacturing; INTL Business, International  
DESCRIPTORS: Neural networks--Research

**22/8/17 (Item 17 from file: 16)**

DIALOG(R)File 16:(c) 2003 The Gale Group. All rts. reserv.

03038368      Supplier Number: 44130284

**Better Than Rocket Science**

Oct, 1993

PUBLISHER NAME: Miller Freeman, Inc.

COMPANY NAMES: \*Visual Solutions Inc.

EVENT NAMES: \*330 (Product information)

GEOGRAPHIC NAMES: \*1USA (United States)

PRODUCT NAMES: \*7372419 (Business Applications Software NEC)

NAICS CODES: 51121 (Software Publishers)

SPECIAL FEATURES: COMPANY

**22/8/19      (Item 19 from file: 160)**

DIALOG(R)File 160:(c) 1999 The Gale Group. All rts. reserv.

01626597

**Hecht-Nielsen unveils first new neural net architecture since '84.**

April 13, 1987

PRODUCT: \*Computer Science (8524400); Computers (3573100)

EVENT: \*Science & Research (31); Product Design & Development (33)

COUNTRY: \*United States (1USA)

**22/3,AB,K/2      (Item 2 from file: 148)**

DIALOG(R)File 148:Gale Group Trade & Industry DB

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10281723      SUPPLIER NUMBER: 20840165

**Kohonen maps for solving a class of location-allocation problems.**

Lozano, S.; Guerrero, F.; Onieva, L.; Larraneta, J.

European Journal of Operational Research, v108, n1, p106(12)

July 1, 1998

ISSN: 0377-2217      LANGUAGE: English      RECORD TYPE: Abstract

ABSTRACT: Artificial **neural networks** may be applied in operations research problems in the same manner as **Kohonen** maps are used in solving location-allocation issues. Location-allocation (LA) problems may be found in public services, telecommunications and distribution. LA problems occur when more than one outlet need to be located and the corresponding allocation for the outlet to serve customers' demands are not known.

**Kohonen** maps are two-layered networks where every output unit links with every input unit, may be synonymous to clustering methods.

**22/3,AB,K/3      (Item 3 from file: 98)**

DIALOG(R)File 98:General Sci Abs/Full-Text

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03517445      H.W. WILSON RECORD NUMBER: BGSI97017445

**Knowledge discovery in reaction databases: landscaping organic reactions by a self-organizing neural network.**

Chen, Lingran

Gasteiger, Johann

Journal of the American Chemical Society (J Am Chem Soc) v. 119 (Apr. 30 '97) p. 4033-42

DOCUMENT TYPE: Feature Article

SPECIAL FEATURES: bibl il      ISSN: 0002-7863

LANGUAGE: English

COUNTRY OF PUBLICATION: United States

ABSTRACT: Chemists have always derived their knowledge about chemical reactions by inductive learning from observations on a series of individual chemical reactions. Predictions of the products of chemical reactions are made by analogy. With the availability of large reaction databases this

process can be automated. In this paper a new method based on a Kohonen **neural network** and physicochemical variables for describing reaction centers is developed for this purpose. The results with two reaction datasets show how a set of chemical reactions with the same reaction center can automatically be classified, clearly revealing different levels of similarities of the reactions under investigation. The relative positions of reactions and clusters in the two-dimensional **Kohonen** map offer extra chemical information. A third reaction dataset is used to show how a trained **Kohonen** network can be used to predict reaction types for organic reactions. Copyright 1997, American Chemical Society.

**22/3,AB,K/6 (Item 6 from file: 148)**

DIALOG(R)File 148:Gale Group Trade & Industry DB

(c)2003 The Gale Group. All rts. reserv.

09018959 SUPPLIER NUMBER: 18759130

**Heuristic and optimization approaches to extending the Kohonen self organizing algorithm.** (Neural Networks and Operations Research/Management Science)

Nour, Mohamed A.; Madey, Gregory R.

European Journal of Operational Research, v93, n2, p428(21)

Sep 6, 1996

ISSN: 0377-2217 LANGUAGE: English RECORD TYPE: Abstract

ABSTRACT: An overview of research into the use of heuristic and optimization methods to extend the **Kohonen self-organizing map (KSOM) neural network** is given. Currently, research efforts are directed at enhancing KSOM's complexity, accuracy, robustness, efficiency and adaptability. Specifically, they attempt to improve the KSOM's learning mode, network architecture, neighborhood function, adaptation rule, weight initialization, convergence criteria and rejection criteria.

**22/3,AB,K/8 (Item 8 from file: 98)**

DIALOG(R)File 98:General Sci Abs/Full-Text

(c) 2003 The HW Wilson Co. All rts. reserv.

03031593 H.W. WILSON RECORD NUMBER: BGS195031593

**Modeling of property prediction from multicomponent analytical data using different neural networks.**

Majcen, Nineta

Rajer-KanduZc, Karmen; NoviZc, Marjana

Analytical Chemistry (Anal Chem) v. 67 (July 1 '95) p. 2154-61

DOCUMENT TYPE: Feature Article

SPECIAL FEATURES: bibl il ISSN: 0003-2700

LANGUAGE: English

COUNTRY OF PUBLICATION: United States

ABSTRACT: Two different artificial **neural network** (ANN) strategies for building a model for the quantitative prediction of the property called "total color difference" are described. The models in the study are based on eight different complex oxide concentration measurements. The models obtained by the ANNs are compared with the multivariate linear regression model. Besides the two ANN strategies used for building the models (the error backpropagation and the counterpropagation), the **Kohonen** learning strategy is used to make a partial experimental design, i.e., to select data most suitable for building the models. An additional goal, building a rule or "formal knowledge", about the quality of the product, is achieved by overlapping eight two-dimensional maps of weights obtained in the counterpropagation **neural network**. Copyright 1995, American Chemical Society.

**22/3,AB,K/10 (Item 10 from file: 148)**  
DIALOG(R)File 148:Gale Group Trade & Industry DB  
(c)2003 The Gale Group. All rts. reserv.  
07675503 SUPPLIER NUMBER: 16748600 (USE FORMAT 7 OR 9 FOR FULL TEXT)  
**NEURAL NETWORKS : SCIENTIFIC COMPUTERS SPREADS THE GOSPEL WITH KOHONEN NETWORK.**  
Computergram International, pCGN01240008  
Jan 24, 1995  
ISSN: 0268-716X LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT  
WORD COUNT: 1181 LINE COUNT: 00089

**22/3,AB,K/14 (Item 14 from file: 98)**  
DIALOG(R)File 98:General Sci Abs/Full-Text  
(c) 2003 The HW Wilson Co. All rts. reserv.  
02777021 H.W. WILSON RECORD NUMBER: BGS194027021  
**Opening up the black box of artificial neural networks.**  
Spining, M. T  
Darsey, J. A; Sumpter, B. G  
Journal of Chemical Education (J Chem Educ) v. 71 (May '94) p. 406-11  
DOCUMENT TYPE: Feature Article  
SPECIAL FEATURES: bibl il ISSN: 0021-9584  
LANGUAGE: English  
COUNTRY OF PUBLICATION: United States  
ABSTRACT: A general overview of **neural networks** from the viewpoint of chemical applications is presented. **Neural networks** are designed to simulate putative functions of the brain. They can be divided into supervised and unsupervised training categories. The former have paired input and output vectors, for example, a backpropagation network. The latter are used for real-time learning, where the outputs are unknown; one example of which is the **Kohonen** network. The general applicability of **neural networks** is demonstrated by their utilization in spectroscopy, protein structure analysis, and structure-activity and structure-property relationships. Other applications involve computational methods such as quantum mechanics, molecular dynamics, normal coordinate analysis, Monte Carlo methods, and calculating heat capacities. This versatility suggests that **neural networks** may have far-reaching affects.

**22/3,AB,K/16 (Item 16 from file: 98)**  
DIALOG(R)File 98:General Sci Abs/Full-Text  
(c) 2003 The HW Wilson Co. All rts. reserv.  
02750124 H.W. WILSON RECORD NUMBER: BGS194000124  
**A combined application of two different neural network types for the prediction of chemical reactivity.**  
Simon, Vera  
Gasteiger, Johann; Zupan, Jure  
Journal of the American Chemical Society (J Am Chem Soc) v. 115 (Oct. 6 '93) p. 9148-59  
DOCUMENT TYPE: Feature Article  
SPECIAL FEATURES: bibl il ISSN: 0002-7863  
LANGUAGE: English  
COUNTRY OF PUBLICATION: United States  
ABSTRACT: A multilayer **neural network** trained by the back-propagation algorithm is developed that is able to predict which single bonds in aliphatic molecules will break preferentially. Each potential bond breaking is described by seven empirical physicochemical parameters that allow the treatment of large datasets of organic molecules. This makes the approach

outlined in this paper attractive for an automatic learning from reaction databases. It is demonstrated that a **Kohonen** network can be used as a basis for the selection of a training set for a supervised learning method. For training a multilayer **neural network** this selection gives results that are superior to a random selection and also to an experimental design technique. A detailed analysis of the **Kohonen** mapping shows that the chemical similarity of bond breakings is perceived by the topology-conserving **Kohonen** mapping of a multidimensional space.  
Copyright 1993, American Chemical Society.

File 155:MEDLINE(R) 1966-2003/Aug W5  
File 5:Biosis Previews(R) 1969-2003/Aug W4  
File 73:EMBASE 1974-2003/Aug W4  
File 34:SciSearch(R) Cited Ref Sci 1990-2003/Aug W4  
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec  
File 144:Pascal 1973-2003/Aug W4  
File 2:INSPEC 1969-2003/Aug W4  
File 6:NTIS 1964-2003/Aug W5  
File 8:Ei Compendex(R) 1970-2003/Aug W4  
File 94:JICST-EPlus 1985-2003/Aug W5  
File 95:TEME-Technology & Management 1989-2003/Aug W3  
File 99:Wilson Appl. Sci & Tech Abs 1983-2003/Jul  
File 65:Inside Conferences 1993-2003/Aug W5  
File 35:Dissertation Abs Online 1861-2003/Aug

Set	Items	Description
S1	346395	NEURAL()NETWORK? ?
S2	12585	KOHONEN OR CEPSTRUM OR INVERSE() FAST() FOURIER() TRANSFORM?
S3	5649	S1 AND S2
S4	1924220	ADVANTAGE? OR BENEFIT? ?
S5	196	S1(S)S2(S)S4
S6	14	S4(2N)S2
S7	14	S4 AND S6
<b>S8</b>	<b>3</b>	<b>S5 AND S6</b>
S9	6	S3 AND S6
S10	3	S9 NOT S8
<b>S11</b>	<b>1</b>	<b>RD (unique items)</b>

**8/7,K/2 (Item 1 from file: 8)**

DIALOG(R)File 8:Ei Compendex(R)  
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03606994 E.I. Monthly No: EIM9305-028485  
**Title: Adaptive image segmentation by quantization.**  
Author: Liu, Hui; Yun, David Y.  
Corporate Source: Univ. of Hawaii/Manoa, Honolulu, HI, USA  
Conference Title: Neural and Stochastic Methods in Image and Signal Processing  
Conference Location: San Diego, CA, USA Conference Date: 19920720  
Sponsor: SPIE - Int Soc for Opt Engineering, Bellingham, WA, USA  
E.I. Conference No.: 17792  
Source: Proceedings of SPIE - The International Society for Optical Engineering v 1766. Publ by Int Soc for Optical Engineering, Bellingham, WA, USA. p 322-332  
Publication Year: 1992  
CODEN: PSISDG ISSN: 0277-786X ISBN: 0-8194-0939-1  
Language: English  
Document Type: PA; (Conference Paper) Treatment: X; (Experimental); A; (Applications)  
Journal Announcement: 9305  
Abstract: Segmentation of images into textural homogeneous regions is a fundamental problem in an image understanding system. Most region-oriented segmentation approaches suffer from the problem of different thresholds selecting for different images. In this paper an adaptive image segmentation based on vector quantization is presented. It automatically segments images without preset thresholds. The approach contains a feature extraction module and a two-layer hierarchical clustering module, a vector quantizer (VQ) implemented by a competitive learning **neural network** in

the first layer. A near-optimal competitive learning algorithm (NOLA) is employed to train the vector quantizer. NOLA combines the **advantages** of both **Kohonen** self-organizing feature map (KSFM) and K-means clustering algorithm. After the VQ is trained, the weights of the network and the number of input vectors clustered by each neuron form a 3-D topological feature map with separable hills aggregated by similar vectors. This overcomes the inability to visualize the geometric properties of data in a high-dimensional space for most other clustering algorithms. The second clustering algorithm operates in the feature map instead of the input set itself. Since the number of units in the feature map is much less than the number of feature vectors in the feature set, it is easy to check all peaks and find the 'correct' number of clusters, also a key problem in current clustering techniques. In the experiments, we compare our algorithm with K-means clustering method on a variety of images. The results show that our algorithm achieves better performance. 16 refs.

8/7,K/3 (Item 1 from file: 35)

DIALOG(R)File 35:Dissertation Abs Online

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01335694 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.

**HIGH-LEVEL SYNTHESIS OF SYNCHRONOUS DIGITAL SYSTEMS USING SELF-ORGANISATION ALGORITHMS FOR SCHEDULING AND BINDING**

Author: HEMANI, AHMED

Degree: TEKN.DR

Year: 1992

Corporate Source/Institution: KUNGLIGA TEKNISKA HOGSKOLAN (SWEDEN) (1022)

Source: VOLUME 55/01-C OF DISSERTATION ABSTRACTS INTERNATIONAL.

PAGE 268. 196 PAGES

Publisher: ROYAL INSTITUTE OF TECHNOLOGY, S-100 44 STOCKHOLM 70, SWEDEN

To cope with the increasing complexity of digital VLSI circuits and reduce their design time, the level of abstraction used for specification of digital circuits and synthesis from such specifications has been steadily increasing. High-level synthesis increases the level of abstraction to algorithmic level. It takes an algorithm as a specification of the behaviour of a digital circuit and translates it into a register-transfer level description having the same behaviour as the algorithmic specification. Scheduling and binding are two important optimisation problems in high-level synthesis. Solutions to these problems using novel algorithms is the main subject of this thesis.

The recent upsurge of interest in **neural networks** has seen development of some promising optimisation techniques. The **Kohonen** 's self-organisation algorithm and the Hopfield's algorithm are two such techniques. The work presented in this thesis uses **Kohonen** 's self-organisation algorithm to solve the scheduling and binding problems in high-level synthesis. The main **benefits** of **Kohonen** 's self-organisation algorithm are: (1) the ability to escape locally minimum solutions by accepting hill-climbing moves, (2) the cost function is embedded in the process, this results in fast execution time and (3) relatively low-complexity  $O(k \cdot n^2)$ , where  $k$  is the number of control steps available and  $n$  is the number of operations in the behaviour.

The thesis also presents an interactive allocator that uses heuristics to do optimisation and allows the user to explore the design space. Furthermore, a subset for VHDL for high-level synthesis and a representation that holds the behavioural and structural information are presented.



Lastly, the results of applying the self-organising scheduling and binding algorithms to benchmark and other examples are presented.

...novel algorithms is the main subject of this thesis.

The recent upsurge of interest in **neural networks** has seen development of some promising optimisation techniques. The **Kohonen** 's self-organisation algorithm and the Hopfield's algorithm are two such techniques. The work presented in this thesis uses **Kohonen** 's self-organisation algorithm to solve the scheduling and binding problems in high-level synthesis. The main **benefits** of **Kohonen** 's self-organisation algorithm are: (1) the ability to escape locally minimum solutions by accepting...

11/7,K/1 (Item 1 from file: 2)

DIALOG(R)File 2:INSPEC

(c) 2003 Institution of Electrical Engineers. All rts. reserv.

04117809 INSPEC Abstract Number: B9205-6130-008, C9205-5260S-001

**Title: Further developments of a neural network speech fundamental period estimation algorithm**

Author(s): Howard, I.

Conference Title: Second International Conference on Artificial Neural Networks (Conf. Publ. No.349) p.340-4

Publisher: IEE, London, UK

Publication Date: 1991 Country of Publication: UK xii+383 pp.

ISBN: 0 85296 531 1

Conference Sponsor: IEE

Conference Date: 18-20 Nov. 1991 Conference Location: Bournemouth, UK

Language: English Document Type: Conference Paper (PA)

Treatment: Theoretical (T); Experimental (X)

Abstract: This work describes a speech fundamental period estimation algorithm that estimates the time of excitation of the vocal tract using a pattern classifier, the multi-layer perceptron (MLP). The pattern classifier was trained using speech semi-automatically labelled by means of an algorithm that makes use of the output from a Laryngograph. Various issues arising in the training of the system were explored. Three basic configurations of the system were compared using different pre-processing strategies. It was found that processing the sampled speech time-waveform directly with the pattern classifier gave better results than using one of two filterbanks. The performance of the algorithm was evaluated against that of a simple peak-picking algorithm and the well known **cepstrum** algorithm using quantitative frequency contour comparisons. The performance of the new algorithm on a difficult set of test data was shown to be better than the peak-picker and comparable to the **cepstrum** algorithm. The **advantage** of the scheme is that fundamental period estimates are made on a period-by-period basis, thus preserving the irregularity in the speech excitation that is lost by techniques that produce an average period estimate. (14 Refs)

Subfile: B C

File 350:Derwent WPIX 1963-2003/UD,UM &UP=200355  
File 347:JAPIO Oct 1976-2003/May(Updated 030902)  
File 371:French Patents 1961-2002/BOPI 200209

Set	Items	Description
S1	7857	NEURAL()NETWORK? ?
S2	127222	VENTILAT? OR RESPIRAT?
S3	181	CPAP OR CONTINUOUS() POSITIVE() AIRWAY? ?() PRESSURE
S4	39	KOHONEN
S5	299	CEPSTRUM
S6	192	INVERSE() FAST() FOURIER() TRANSFORM?
S7	1606	IC=(A61B-005/087 OR A62B-007/00)
S8	4	S1 AND S3
S9	1	S4:S6 AND S8 [a duplicate]
S10	3	S8 NOT S9
S11	0	S10AND S7
S12	0	S10 AND S7
S13	41	S1 AND S2
S14	1	S4:S6 AND S13
S15	0	S14 NOT S8

10/7,K/1 (Item 1 from file: 350)

DIALOG(R)File 350:Derwent WPIX  
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013684080 \*\*Image available\*\*  
WPI Acc No: 2001-168304/200117

Ventilator comprises ventilator setting control(s), sensors, a processing subsystem, and a feedback system responsive to the response signal of the processing subsystem.

Patent Assignee: UNIV FLORIDA (UYFL )

Inventor: BANNER M J; BLANCH P B; EULIANO N R; PRINCIPE J C

Number of Countries: 021 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 200100265	A1	20010104	WO 2000US18195	A	20000630	200117 B
AU 200060645	A	20010131	AU 200060645	A	20000630	200124

Priority Applications (No Type Date): US 99141676 P 19990630

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
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WO 200100265	A1	E	55	A61M-016/00	
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Designated States (National): AU CA JP

Designated States (Regional): AT BE CH CY DE DK ES FI FR GB GR IE IT LU  
MC NL PT SE

AU 200060645	A		A61M-016/00	Based on patent WO 200100265
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Abstract (Basic): WO 200100265 A1

NOVELTY - A ventilator comprises ventilator setting control(s); sensors for measuring ventilation support parameters; a processing subsystem connected to receive the output signals from the sensors and the ventilator setting parameter signal from the ventilator setting control; and a feed back system responsive to the response signal of the processing subsystem.

DETAILED DESCRIPTION - A ventilator (20) comprises ventilator setting control(s); sensors (52) for measuring ventilation support parameters; a processing subsystem connected to receive the output signals from the sensors and the ventilator setting parameter signal from the ventilator setting control; and a feed back system responsive to the response signal of the processing subsystem. The ventilator

setting control governs the supply of ventilation support from the ventilator to the patient via the breathing circuit. Each setting control is selectable to a level setting. Each ventilator setting control generates a ventilator setting parameter signal indicative of the current level setting of the ventilator setting control. The sensors measure ventilation support parameters. Each sensor is connected to a patient or the breathing circuit. Each sensor generates an output signal based on the measured ventilation support parameter. The processing subsystem has a processor and a memory. The processor runs under control of a program stored in the memory. It has an intelligence system that determines a desired level setting of at least one ventilator setting control in response to the ventilator setting parameter signal and the output signals. It generates a response signal based on the determination. The feedback system adjusts at least one of the level settings of the ventilator setting controls of the ventilator.

An INDEPENDENT CLAIM is also included for a method of controlling pulmonary ventilation for a ventilator comprising:

- (a) receiving at least one ventilator setting parameter signal indicative of the level setting of one ventilator setting control;
- (b) monitoring sensors to determine the sufficiency of ventilation support supplied to the patient; and
- (c) controlling the level settings of the ventilator setting controls in response to the received ventilator setting parameter signal and the output signals.

USE - For supplying breathing gas to a patient via a breathing circuit in fluid communication with at least one lung of a patient for treating patients with respiratory failure.

ADVANTAGE - The invention reduces the high work of breathing load expended by the patient (a) to avoid unnecessary medical complications of the required respiratory support; (b) to prevent further damage to a weakened patient; or (c) if it is beyond the capacity or capability of small or disabled patients. The ventilator delivers the most appropriate mode and intra-mode, the most appropriate quality and quantity of ventilation support required by the patient's current physiological needs by (i) receiving ventilator support signals indicative of the sufficiency of ventilation support received by the patient; (ii) receiving at least one ventilator signal indicative of the level settings of the ventilator setting controls of the ventilator; and (iii) determining the desired level settings of the ventilator setting controls of the ventilator to provide the appropriate quality and quantity of ventilation support to the patient.

DESCRIPTION OF DRAWING(S) - The figure shows a block diagram of the ventilator monitor system.

Ventilator (20)  
Alarm (21)  
Processing subsystem (40)  
Sensors (52)  
Flow rate (53)  
Exhaled gas (54)  
Pressure of the breathing gas (55)  
Blood pressure (56)  
Display (62)  
pp; 55 DwgNo 3/8

Derwent Class: B04; P34; S02; S03; S05; T01  
International Patent Class (Main): A61M-016/00

Abstract (Basic):

Technology Focus:

... expiratory pressure (PEEP) control to set the (PEEP) level setting on the ventilator; (j) a **continuous positive airway pressure (CPAP)** control to set the **CPAP** level setting on the ventilator; or (k) a fractional inhaled oxygen concentration (FIO2) control to...

...pressure support ventilation (PSV) level; (h) a positive end expiratory pressure (PEEP) level; (i) a **continuous positive airway pressure (CPAP)** level; or (j) a fractional inhaled oxygen concentration (FIO2) level, to maintain the sufficiency of...

...to the patient is governed in response to the driver signal. The processing subsystem has **neural network** (s) and processor. The processor, in determining the desired level settings of the ventilator setting...

...ventilation data and at least a portion of the ventilator setting parameter signal to the **neural network**.

10/7,K/2 (Item 2 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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013684079 \*\*Image available\*\*

WPI Acc No: 2001-168303/200117

Ventilation support monitoring system for a ventilator comprises input, sensors, and a processing subsystem that receives the output signals from the sensors and the ventilator setting parameter signal from the input

Patent Assignee: UNIV FLORIDA (UYFL )

Inventor: BANNER M J; BLANCH P B; EULIANO N R; PRINCIPE J C

Number of Countries: 022 Number of Patents: 003

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 200100264	A1	20010104	WO 2000US18175	A	20000630	200117 B
AU 200060640	A	20010131	AU 200060640	A	20000630	200124
EP 1189649	A1	20020327	EP 2000946958	A	20000630	200229
			WO 2000US18175	A	20000630	

Priority Applications (No Type Date): US 99141735 P 19990630

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes

WO 200100264 A1 E 54 A61M-016/00

Designated States (National): AU CA JP

Designated States (Regional): AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE

AU 200060640 A A61M-016/00 Based on patent WO 200100264

EP 1189649 A1 E A61M-016/00 Based on patent WO 200100264

Designated States (Regional): AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

Abstract (Basic): WO 200100264 A1

NOVELTY - A ventilation support monitoring system comprises an input that receives at least one ventilator setting parameter signal; sensors for measuring ventilation support parameters; and a processing subsystem connected to receive the output signals from the sensors and the ventilator setting parameter signal from the input.

DETAILED DESCRIPTION - A ventilation support monitoring system comprises an input that receives at least one ventilator setting parameter signal; sensors (52) for measuring ventilation support parameters; and a processing subsystem connected to receive the output

signals from the sensors and the ventilator setting parameter signal from the input. Each sensor connects to a select one of the patient or the breathing circuit. Each sensor generates an output signal based on the measured ventilation support parameter. The processing subsystem has a processor and a memory. The processor runs under control of a program stored in the memory. It has an intelligence system that determines a desired level setting of at least one ventilator setting control in response to the ventilator setting parameter signal and the output signals.

INDEPENDENT CLAIMS are also included for:

(1) a ventilation support monitoring method for a ventilator (20) having selectable ventilator setting controls for governing supply of the breathing gas from the ventilator to the patient, each setting control selectable to a level setting comprising:

(a) receiving at least one ventilator setting parameter signal indicative of the level setting of one ventilator setting control;

(b) monitoring sensors to determine the sufficiency of ventilation support supplied to the patient; and

(c) determining the desired level setting of at least one ventilator setting control of the ventilator. Each sensor is connected to a select one of the patient or the breathing circuit, and generates an output signal; and

(2) a method for differential determination of desired level settings of a ventilator comprises:

(a) supplying a breathing gas from the ventilator to a patient via a breathing circuit in fluid communication with the ventilator and at least one lung of the patient;

(b) receiving output signals indicative of the physiological characteristics of the patient and the characteristics of the breathing gas supplied to the patient;

(c) receiving ventilator setting parameter signals indicative of the level settings of the ventilator setting controls;

(d) deriving ventilation data from the output signals;

(e) selecting at least a portion of the ventilation data and at least a portion of the ventilator setting parameter signals;

(f) converting the selected portion of the ventilation data and the selected portion of the ventilator setting parameter signals into numerical expressions;

(g) transforming each of the numerical expressions into a number in a predetermined range;

(h) inputting the transformed numerical expressions into a **neural network** ; and

(i) determining at least one of the desired level settings of the ventilator setting controls using the **neural network** in accordance with the input numerical expressions.

USE - For a ventilator supplying breathing gas to a patient via a breathing circuit in fluid communication with at least one lung of a patient for treating patients with respiratory failure.

ADVANTAGE - The invention reduces the high work of breathing load expended by the patient (a) to prevent further damage to a weakened patient; or (b) if it is beyond the capacity or capability of small or disabled patients. The ventilator monitor system delivers the most appropriate mode and intra-mode, the most appropriate quality and quantity of ventilation support required by the patient's current physiological needs by (a) receiving ventilator support signals indicative of the sufficiency of ventilation support received by the

patient; (b) receiving at least one ventilator signal indicative of the level settings of the ventilator setting controls of the ventilator; and (c) determining the desired level settings of the ventilator setting controls of the ventilator to provide the appropriate quality and quantity of ventilation support to the patient.

DESCRIPTION OF DRAWING(S) - The figure shows a block diagram of the ventilator monitor system.

Ventilator (20)  
Alarm (21)  
Processing subsystem (40)  
Sensors (52)  
Flow rate (53)  
Exhaled gas (54)  
Pressure of the breathing gas (55)  
Blood pressure (56)  
Display (62)  
pp; 54 DwgNo 3/8

Derwent Class: B04; P34; S02; S05; T01

International Patent Class (Main): A61M-016/00

Abstract (Basic):

Technology Focus:

... expiratory pressure (PEEP) signal indicative of the PEEP level set on the ventilator; (i) a **continuous positive airway pressure (CPAP)** signal indicative of the **CPAP** level set on the ventilator; or (j) a fractional inhaled oxygen concentration (FIO2) signal indicative...

...Preferred Component: The processing subsystem has (a) **neural network** (s) under control of a program stored in the memory, and (b) a mechanism for...

...of the ventilation data and the portion of the ventilator setting parameter signal to the **neural network** to generate the desired level settings of the ventilator setting controls.

10/7,K/3 (Item 3 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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012721051 \*\*Image available\*\*

WPI Acc No: 1999-527163/199944

Sleep disorder breathing treating method using artificial neural network

Patent Assignee: UNIV TEXAS SYSTEM (TEXA )

Inventor: BEHBEHANI K; BURK J R; LOPEZ F J; LUCAS E A

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 5953713	A	19990914	US 95548424	A	19951026	199944 B
			US 97928791	A	19970912	

Priority Applications (No Type Date): US 95548424 A 19951026; US 97928791 A 19970912

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5953713	A	33	G06E-001/00	Cont of application	US 95548424

Abstract (Basic): US 5953713 A

NOVELTY - The interface (1) connected to pressurized gas source is placed over patient's airway. The respiration related variable in the interface is measured and frequency data from that variables is input

to the artificial **neural network** . The **neural network** recognizes patterns characterizing sleep disorder breathing based on which pressurized gas is supplied to patient's airway.

DETAILED DESCRIPTION - During measurement of the respiration related variables, frequency spectrum corresponding to variables is obtained. The number of output of artificial **neural network** over selected interval is compared to selected threshold value. The sleep disorder breathing is indicated only if number of outputs of artificial **neural network** exceeds selected threshold value. An INDEPENDENT CLAIM is also included for describing sleep disorder breathing treatment apparatus.

USE - For treating sleep disorder breathing using artificial **neural network** .

ADVANTAGE - Improves detection accuracy of pharyngeal wall vibration or other apenic events using simple technique. The patient with the sleep disorder breathing, experiences more comfort then with **CPAP** apparatus, since ability to discriminate between pharyngeal wall vibration and noise percent in the system is improved to deliver positive airway pressure to patient and reduce pressure when apneic events are not occurring. During recognition of the patterns characterizing the sleep disorder breathing, the weights of the nodes of the network are changed by calculated amount that minimizes error between actual output of network and desired output.

DESCRIPTION OF DRAWING(S) - The figure shows the adaptive positive airway pressure apparatus.

Interface (1)

pp; 33 DwgNo 1/8

Derwent Class: T01

International Patent Class (Main): G06E-001/00

File 348:EUROPEAN PATENTS 1978-2003/Aug W04

File 349:PCT FULLTEXT 1979-2002/UB=20030828,UT=20030821

Set	Items	Description
S1	6316	NEURAL()NETWORK? ?
S2	70758	VENTILAT? OR RESPIRAT?
S3	514	CPAP OR CONTINUOUS() POSITIVE() AIRWAY? ?() PRESSURE
S4	329	KOHONEN
S5	471	CEPSTRUM
S6	1097	INVERSE() FAST() FOURIER() TRANSFORM?
S7	358	IC=(A61B-005/087 OR A62B-007/00)
<b>S8</b>	<b>2</b>	<b>S1(S)S3 [duplicates]</b>
<b>S9</b>	<b>1</b>	<b>S8 AND S4:S6 [a duplicate]</b>
S10	1	S1(S)S2(S)S4:S6
S11	0	S10 NOT S8:S9
S12	44	S1(S)S2
S13	2	S12 AND S7
<b>S14</b>	<b>1</b>	<b>S13 NOT S8:S9</b>

14/3,AB,K/1 (Item 1 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

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00894700

**MEDICAL VENTILATOR TRIGGERING AND CYCLING METHOD AND MECHANISM**

**PROCEDE ET DISPOSITIF DE DECLenchement ET DE MISE EN FONCTIONNEMENT**

**PERIODIQUE D'UN VENTILATEUR MEDICAL**

Patent Applicant/Assignee:

RESPIRONICS INC, 1501 Ardmore Boulevard, Pittsburgh, PA 15221-4401, US,  
US (Residence), US (Nationality)

Inventor(s):

JAFARI Mehdi M, 25982 Anacapa Street, Laguna Hills, CA 92653-6266, US,  
KIMM Gardner J, 4319 Point Reyes Court, Carlsbad, CA 92008, US,  
MCGUIGAN Karrie, 241 Muirfield Way, San Marcos, CA 92069, US,

Legal Representative:

GASTINEAU Cheryl L (et al) (agent), Reed Smith LLP, P.O. Box 488,  
Pittsburgh, PA 15230-0488, US,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200228460 A1 20020411 (WO 0228460)

Application: WO 2001US31262 20011005 (PCT/WO US0131262)

Priority Application: US 2000238387 20001006; US 2001970383 20011002

Designated States: AU BR CA JP

(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR

Publication Language: English

Filing Language: English

Fulltext Word Count: 18473

English Abstract

A medical ventilator system (30) and method that triggers, cycles, or both based on patient effort, which is determined from cross-correlating patient flow and patient pressure. The medical ventilator is also controlled such that sensitivity to a patient initiated trigger increases as the expiratory phase of the breathing cycle progresses. The present invention also provides adaptive adjustment of cycling criteria to optimize the cycling operation.

...International Patent Class: **A62B-007/00**

Fulltext Availability: Detailed Description

Detailed Description

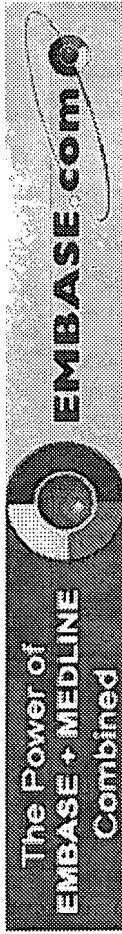
... that the above described triggering and cycling techniques perform



effectively when implemented on an Esprit **Ventilator** across all possible lung parameters (resistance, compliance) for each patient type (adult, pediatric) and inherent breathing required to trigger a breath on one hand and minimizing the **ventilator** autocycling (false triggering) on the other. Thus, for this example, the triggering criterion may be adjusted breath by breath using any conventional technique, such as dynamical programming, **neural networks**, fuzzy logic, etc., while signs of autocycling are being estimated or monitored. The adjustment of...

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Searched for: : All of the words ("neural network") AND (cpap AND kohonen)

Found: : 5 total | [journal results](#) | [5 Web results](#)

Sort by: : [relevance](#) | [date](#)

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- ☐ **1.** [SPIE Proceedings Vol. 3390](#)  
Jun 2002  
...formulation of partial least-squares regression: a robust **neural network** approach  
(Paper #: 3390-04) \* Summary of the **neural**...satellite imagery (Paper #: 3390-08) \*  
Pulse-coupled **neural networks** (PCNN) and new approaches to biosensor applications...  
[<http://www.spie.org/web/abstracts/3390/3390.html>]  
[similar results](#)

- ☐ **2.** [No Title](#)  
Sep 2000  
...vasomotor tone. These changes are induced by the fast responding **neural** control and  
by the slow responding hormonal control. The heart...cardiac control. The reÂ maining  
control mechanisms are the **neural** and hormonal regulation of vasomotor tone and  
hormonal regulation...  
[<http://cinc.mit.edu/Program/abstracts.ps>]  
[similar results](#)

- ☐ **3.** [No Title](#)  
Jun 1998  
...Kiyohiro Shikano 314 An Application of Recurrent **Neural Networks** to Low Bit Rate

Or refine using:

All of the words

[refine](#)

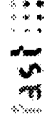
Speech Coding Minoru Kohata 318 CELP...Model Cheung-Fat Chan, Wai-Kwong Hui 326  
 Recurrent **Neural Networks** for Phoneme Recognition Takuya Koizumi, Mikio Mori...  
 more hits from [<http://www.asel.udel.edu/icslp/cdrom/toc.html>]  
[similar results](#)

☐ **4.** [Technical Program Contents](#)

Sep 1996  
 ...Yonezaki, Kiyohiro Shikano An Application of Recurrent **Neural Networks** to Low Bit  
 Rate Speech Coding Minoru Kohata CELP Coding...Excitation Model Cheung-Fat Chan, Wai-  
 Kwong Hui Recurrent **Neural Networks** for Phoneme Recognition Takuya Koizumi, Mikio  
 Mori...  
[\[http://www.asel.udel.edu/icslp/cdrom/session.htm\]](http://www.asel.udel.edu/icslp/cdrom/session.htm)  
[similar results](#)

☐ **5.** [Schedule](#)  
 Sep 1996

...Yonezaki, Kiyohiro Shikano An Application of Recurrent **Neural Networks** to Low Bit  
 Rate Speech Coding Minoru Kohata CELP Coding...Excitation Model Cheung-Fat Chan, Wai-  
 Kwong Hui Recurrent **Neural Networks** for Phoneme Recognition Takuya Koizumi, Mikio  
 Mori...  
[\[http://www.asel.udel.edu/icslp/session.html\]](http://www.asel.udel.edu/icslp/session.html)  
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("neural network") AND (cpap AND cepstrum)

☐ All journal sources    ☒ All Web sources    ☐ Exact phrase

Search

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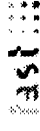
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...Stage Scoring by an Artificial **Neural Network** Chip Stewart,1 Ivan Pal,1 Robert...algorithm using an artificial **neural network** (ANN) which is trained and tested...diagnostic Sleep Dis- ordered **Breathing** studies, 10 **CPAP** titrations, and 14 studies from...  
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Feb 2003  
...ZEEP, Sigh and PEEP Ã± Yardimci, G Meyanci, H Ã-z, I Paksoy P30 The pattern of **breathing** and chest wall movements at different levels of pressure support and PEEP D Chiumello...  
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Apr 2002  
Sleep Research Society A287 POSTER PRESENT ATIONS SLEEP, Vol. 25, Abstract Supplement 2002 392.A SAPORIN LESIONS OF THE DORSOLATERAL PONS INCREASE NIGHTTIME SLEEP WHEREAS A-DBH- SAP LESIONS DO NOT Blanco-Centurion CA,1 Gerashchenko D,1 Murillo-Rodriguez E...  
[[http://www.apss.org/2002Abstracts/Posters\\_Split/Poster...](http://www.apss.org/2002Abstracts/Posters_Split/Poster...)]  
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☐ **5.** Document:

Nov 2001  
Scientific and Technical Aerospace Reports Volume 39 November 16, 2001 National Aeronautics and Space Administration Langley Research Center Scientific and Technical Information Program Office The NASA STI Program Office . . . in Profile Since its founding...  
[<http://www.sti.nasa.gov/Pubs/star/star0123.pdf>]  
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☐ **6.** SPIE Proceedings Vol. 3390

Jun 2002  
...formulation of partial least-squares regression: a robust **neural network** approach (Paper #: 3390-04) \* Summary of the **neural**...satellite imagery (Paper #: 3390-08) \* Pulse-coupled **neural networks** (PCNN) and new approaches to biosensor applications... more hits from [<http://www.spie.org/web/abstracts/3300/3390.html>]  
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Sep 2000  
...vasomotor tone. These changes are induced by the fast responding **neural** control and by the slow responding hormonal control. The heart...cardiac control. The reA maining control mechanisms are the **neural** and hormonal regulation of vasomotor tone and hormonal regulation...  
[<http://cinc.mit.edu/Program/abstracts.ps>]  
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☐ **8.** No Title

Jun 1999  
Department of Anaesthesia & Intensive Care Faculty of Medicine 209 RESEARCH PROJECTS The Effect of Syntocinon on the Gravid Uterus During Early Pregnancy WONG Chui Wah LAU Tze Kin (Obstetrics & Gynaecology) FUNG Tak Yuen (Obstetrics &

Gynaecology) CHAN Tak...  
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...indications on the prediction of falling risk. 2 M-NET: **neural network** for surface electromyographic screen- ing Å N. Accorneroa...and vibratory signal (AMG) of the examined muscle. **Neural network** receives both signals sampled at 1 Hz for 20 s and...  
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...to the receptor region (sensory loss) or damage the central olfactory pathways (**neural** loss). Diseases of internal medicine, especially endocrine disease can account...  
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Jun 2000

...Synthesis of optimal strategies for differential games by **neural networks**. - In: Proc. of the 6th Int. Sympos. on Dynamic Ga...Comparison of various MOS-FET models. - In: Systems and **networks**: Eds.: U. Helmke et al.; Desgl. in: Math. theory and... more hits from [<http://www.biblio.tu-muenchen.de/jahrbuch/94.pdf>] [similar results](#)

☐ **12.** [MPhilThesis.PDF](#)  
Jun 2002

...the frontal activation element of the working memory **neural network**. A less complex task of sustained visual attention...visual attention. Additionally, a more integrated **neural network** might be revealed with whole brain functional scans... [<http://www.ccs.fau.edu/~modestino/MPhilThesis.PDF>] [similar results](#)

☐ **13.** [FindArticles.com - Search Results for: +Apnea :](#)  
Dec 2002

...and therapy for sleep-disordered **breathing**, a potentially life-threatening...find links to related sites. The **CPAP** Store LLC for Sleep apnea and **CPAP**...Roig, Gerard Huchon Page

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- ☐ **14.** NYU School of Medicine Sleep Disorders Center  
Mar 2003  
...CO2 homeostasis during periodic **breathing**. Predictions from a computer model...and standards for use of nasal **CPAP** in sleep apnea syndromes - Report...Sleep stage scoring by artificial **neural network**. Proceedings of the 3rd International...  
[http://www.med.nyu.edu/sleep/publications.html]  
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Research Report 2001 THE UNIVERSITY OF MELBOURNE i Table of Contents FOREWORD Professor Frank P. Larkins Deputy Vice-Chancellor (Research) ..... v RESEARCH PERFORMANCE OVERVIEW The University of...  
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...Grant N N University of Adelaide \$110,096 Functional analysis of **neural** cells produced by ES cell differentiation N N University of...250 The respiratory effects of prenatally-induced disorders of **neural** development N N Royal Melbourne Institute of Technology \$114...  
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Sep 1997  
...state device designer Bing Sheu, and photonics and **neural network** expert Armand Tanguay Jr. The Berger team's work also...obstructive sleep apnea-hypopnea syndrome, a sleep **breathing** disorder. Individuals who suffer from this...  
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Medical Devices Agency Evaluation Service Comprehensive list of evaluation reports published on or before 2000 listed under Diagnostic imaging, General medical, Pathology and Special reports Contact details for the Medical Devices Agency evaluation centres... [http://www.medical-devices.gov.uk/mda/mdawebsitev2.nsf...]

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Oct 2001

...Animal. Departament de Biologia. -- À«Helth Telematics Training **Network** (HEALTHNET)À». PALOU OLIVER, Andreu; ROCA SALOM, M. del Pilar...Dret Civil. Departament de Dret Privat. -- À«Inf ormatio**n Network** f or B usines s & Employeme nt C re at ion (I NFOBus iness...

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**Babuska, R. / Alic, L. / Lourens, M.S. / Verbraak, A.F.M. / Bogaard, J., Artificial Intelligence in Medicine,**  
 Jan 2001

...C.W. Multispectral magnetic resonance images segmentation using fuzzy Hopfield **neural network** Int. J. Biomed. Comput. 42 3 1996 205 214 [10] Zouridakis G. Jansen B.H. Boutros...

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- ☐ **22.** [Treatment of obstructive sleep apnea syndrome by monitoring patients airflow signals](#)  
**Kermit, M. / Eide, A.J. / Lindblad, T. / Waldemark, K., Pattern Recognition Letters,** Mar 2000  
 ...Technology, Stockholm , Sweden The **breathing** patterns from sleeping persons...measured. A method based on the **neural network**-like O-algorithm has been applied...Sleep apnea syndrome O-algorithm **Neural networks** Wavelet transform 1 Introduction...

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**Biological Psychiatry,** Apr 1999  
 ...schizophrenia with a focus on experimental design and probe construction. To identify **neural** substrate that

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...processing techniques and artificial **neural network** will be used in this project to...ECG classification, Artificial **Neural Network** Pressure Control For Sleep Apnea...Continuous pressure airway pressure (**CPAP**) and the bi-level **CPAP** have served...

[<http://www.aut.ac.nz/conferences/9epgc/inserts/9NZETPC...>]

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☐ **26.** [Issue 15/2002 \(April 11, 2002\) of the PCT Gazette](#)

Apr 2003

...7860 Spoettrup (DK). (74) ERICSSON TELECOM AB; Patent Unit Service and Backbone **Networks**, S-126 25 Stockholm (SE). (81) AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN...

[<http://www.wipo.org/pct/en/gazette/2002/pdf/152002-1.p...>]

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☐ **27.** [SPIE Proceedings Vol. 3728](#)

Jun 2002

...3728 Ninth Workshop on Virtual Intelligence/Dynamic **Neural Networks** Editor(s): Thomas Lindblad, Royal Institute of Technology...novel concepts for a neuroaccelerator for spiking **neural networks** (Paper #: 3728-07)  
\* HUGIN: a small satellite trying...

[<http://www.spie.org/web/abstracts/3700/3728.html>]

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☐ **28.** [Microsoft Word - med faculty e14.rtf](#)

Dec 2001

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Aug 2000

S1 The non-invasive monitoring of human brain function is developing very rapidly at the methodological level. Recent advances in event related MRI and in computerised analysis of structural images have been the most interesting developments. Event related...

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Sep 2001

...the daytime and nighttime levels decrease and normalise with **CPAP**. During sleep with obstructive apneas, MSA follows a peculiar...Mueller manœuvre. The reduced MSA with resolution of obstruction by **CPAP** contributes to the resetting of the parasymphathetic activity...

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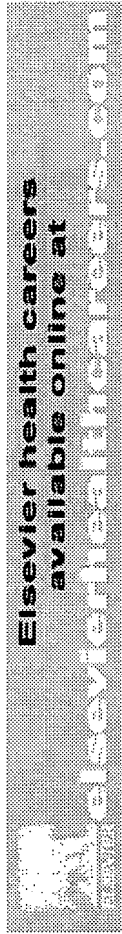
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Jun 2001

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May 1999

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Hypnosis and Anaesthesia MORLEY Andrew P. 1 March 1997 CUHK Research Committee...  
[http://www.cuhk.edu.hk/rtao/research/rpp9697/medicine....]  
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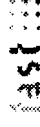
Sep 2000

...Bulirsch Breitner, M.H.; Rettig, U.; Stryk, O. von: Robust optimal control with large  
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IMACS World Congr...  
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☐ **36.** European Journal of Heart Failure, 2 (0) "Supplement 1".

Apr 2003

...of diuretics in chronic heart failure: Data from the Italian **Network** on Congestive Heart  
Failure (IN-CHF) database 22 -- 22 P. Faggiano...failure before the results of RALES  
Study. Data from the Italian **Network** on Congestive Heart Failure (IN-CHF) 22 -- 22 P.  
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